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THE RUBBER AGE AND TIRE NEWS

G. M. SANGSTER, JR., MANAGING EDITOR
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Standards in the Relation Between Illumination and Output*

By Ward Harrison

Chairman of Committee on Reciprocal Relations, Illuminating Engineering Societies

Artificial lighting is often judged as good or bad depending upon the degree wherein it differs from the daylight conditions to which we are accustomed. Granting for the time that such a basis of evaluation may be a reasonable one, it is of interest to investigate the most usual differences between daylight illumination of interiors and its substitutes. The two most common points of difference are: first, lesser diffusion of light—that is, small sources of high brilliancy cause glare and objectional shadows as contrasted with the large light-giving areas of low brightness, such as the windows; second, lesser quantity of illumination both on the work and on adjacent surfaces.

Inferiority in respect to diffusion of light (glare) although almost universal, is unquestionably a matter of neglect or of misapprehension of the principles of illumination, for today well diffused light costs little if any more than the other variety. On the other hand the question of the quantity of light to be supplied is usually considered to be an economic one. True, a certain minimum illumination is necessary to provide against accident, and should be supplied without regard to cost, and for certain operations a considerably greater amount than this minimum may be required to conserve the vision of the employes. In passing it may be noted that both of these factors are now recognized in the industrial codes of several states.

On the other hand, the experience of those who have investigated the subject most thoroughly is that in the majority of industrial operations it is not either one of the foregoing factors, accident prevention or conservation of vision, which should finally fix the quantity of illumination to be supplied in a given case.

Vision Depends on Illumination

In examining the works of a watch we almost involuntarily move over toward the window, although the illumination at all points in the room may be far above that ordinarily required to prevent eye strain. *We find that we can see more with increased illumination.* An examination of the Snellen's Chart under two degrees of illumination, say one foot-candle and ten foot-candles, will serve to confirm this belief. Again, we all know that a late afternoon tennis match must stop long before the ball, stationary, has become invisible to the players. *More light is required when objects in motion are to be discerned, or conversely, one's quickness of vision depends upon the degree of illumination supplied.* (The second simple demonstration is illustrative of this point.) Likewise, if, after an illumination has been reached under which we see both quickly and easily, the quantity of light is continually increased, it is reasonable to suppose that we will eventually come to the point where there is too much light, and where our ability to see is actually diminshed thereby.

The foot-candle meter is a small, portable instrument which measures illumination directly in foot-candles. Since the foot-candle is rapidly becoming recognized as the popular as well as the scientific measure of illumination, this meter is a very practical measuring instrument. Technical knowledge of photometry is not required in its use because the adjustment is simple and determinations are made without the assistance of mathematical calculations. The foot-candles of illumination at any place are indicated by the point where the spots on the foot-candle screen change from brighter than their background to darker.

Indoor Illumination

In reality, however, there is little likelihood of ever getting our general level of artificial illumination too high, particularly in view of the fact that average outdoor illumination on a cloudy day is something like 1,000 foot-candles (units of illumination) and that a snow field does not become uncomfortably bright until illuminated to perhaps 5,000 foot-candles. Artificial illumination in industrial plants usually falls between ½ and 10 foot-candles with a pronounced leaning in the direction of the smaller figure. Good indoor daylight is ordinarily considered to be not less than 15 foot-candles.

At this point the main thesis of this article at once suggests itself. How far does it pay to go? How many foot-candles should be supplied for a given operation in order that it may be conducted most economically, taking into account both the cost of the lighting and the possible increase in production and decrease in cost of manufacture which results from the change in lighting? Such positive knowledge of the subject as there is now available may be expressed in a very few words.

First: Night shifts, or for that matter evening shifts are notoriously inefficient. Their production averages from 10 to 25 per cent less than that of day shifts. The difference is due, in part at least, to the inadequacy of the lighting ordinarily supplied.

Second: In plants averaging, say 100 square feet of floor space per employe the cost of good artificial lighting per foot-candle supplied is usually not in excess of 0.1 per cent of the employe's remuneration during the period.

Third: It is the concensus of opinion that while good lighting, as well as all other hygienic conditions, is conducive to a willingness to do more work, the increased production resulting from improved illumination is not due chiefly to a stimulative effect, but principally to the elimination of those small losses of time, and aggravating interruptions in the work, which result from inadequate illumination.

Fourth: In all of the efficiency tests conducted to date the highest level of illumination investigated has invariably shown the greatest production and the greatest economy. In fact in the range considered, the relation of decreased production costs to total lighting costs is of the order of 10 to 1. Four such tests which were conducted in a thoroughly scientific

* A paper presented at a meeting of the Taylor Society held at Rochester, N. Y., May 6, 7, and 8

manner under the supervision of W. A. Durgin show increases in production of 10 to 20 per cent resulting from better lighting.

Many Investigations Made

In addition to the Durgin tests noted above, there have been several other less complete investigations in various industries which have also indicated substantial gains from the liberal employment of properly designed illumination. It is evident, however, that the imperative need of the art is for a far greater number of exhaustive tests covering many industries, tests which not only establish the range over which illumination may be profitably increased for a given operation, but, are also carried to such a point of extremely high illumination that an actual decrease in economy is recorded due to the increased production, if there is any, being insufficient to compensate for the added cost of the light. All of these needs seem so simple and so obvious that you are inclined to ask why hasn't all this been taken care of long ago. The answer is that those interested in the subject of scientific illumination have been men trained in designing better lighting systems, and in improving the efficiency of our lighting units. It is only through their efforts that artificial lighting comparable with daylight has become available and at a reasonable price. These men very properly look to those skilled in the science of management to cooperate with them in solving the second part of the problem: that is, in determining just what degree of illumination is desirable and profitable in a given industry. As Chairman of the Reciprocal Relations Committee of the Illuminating Engineering Society I commend this subject to the serious consideration of the members of the Taylor Society, and assure you that if you see fit to inaugurate such tests in your own plants or in the plants of your clients, the Illuminating Engineering Society will be glad indeed to furnish you with the best technical advice on the design of the various lighting systems and the choice of equipment.

In the appendix to this article there has been included a list of factors which have been found in previous tests to require particular attention.

Appendix

1. The test should cover a considerable number of operators working in the test area, supplied with a uniform illumination.

2. Separate work sheet should be kept for each man.

3. The humidity of the atmosphere, the time of the year, the days of the week, and days before and after holidays should all be closely noted, as any of these may cause a variation in production.

4. There should be a number of different illumination steps employed in the test. It is preferable to start with the original system, and check back on this original system several times, as well as to check production at least two times at each level. A check should also be kept on the daylight production when possible.

5. The material supplied the men should be closely inspected for at this time especially many plants have considerable difficulty in securing their rough products: rough castings may one week require finishing down ¼ in., and the next week the shipment may have to be finished ⅜ in.

6. It is desirable that a knowledge that test is under way be kept from the men when possible.

7. There should be a close supervision of the men at all times to see that they are all at work and to note any change in personnel.

8. There should be a close check on the material supplied the men as well as the power supply, in order to note any shutdown from either of these causes.

9. Objection from the workmen is liable to be experienced when changing the size of lamps and reflectors, but this can largely be overcome by making all changes over the week end.

10. The foot-candle illumination shouuld be measured at the beginning and end of the hours under consideration as well as at certain intermediate hours. Definite stations should be located for these readings.

Public Holidays for July

The following calendar of bank and public holidays, which will be celebrated in July in the states and countries and on the dates enumerated below, is furnished by the Guaranty Trust Company of New York.

Thursday, July 1—Brazil (State of Amazons), Canada, Ceylon, Newfoundland, Siam (Bangkok)

Friday, July 2—Brazil (State of Bahia)

Sunday, July 4—Guatemala, Nicaragua, Panama, Uruguay (as this date is on Sunday the celebration may take place on the following day, especially as all of these holidays are in honor of the United States—see July 5). By State law when the 4th of July falls on Sunday in the United States and its possesions the following day will be observed.

Monday, July 5—Czechoslovakia (in Moravia and Silesia) Guatemala (probably) Panama (probably) Uruguay (probably) and Venezuela. In the United States: In every state of the Union and the District of Columbia also in Alaska, Hawaii, Phillipine Islands, Porto Rico and Virgin Islands.

Tuesday, July 6—Czechoslovakia.

Wednesday, July 7—Dominican Republic.

Thursday, July 8—Brazil (State of Sao Paulo)

Friday, July 9—Argentina.

Monday, July 12—Brazil (State of Ceara) Bulgaria, Dominican Republic, Greece, Jugoslavia, Porto Rico, Rhodesia, Rumania, North Russia, South Russia, Serbia, Ukrainia.

Tuesday, July 13—Rhodesia.

Wednesday, July 14—Algeria, Brazil, Costa Rica, France, French Guiana, French Indo-China, French West India and al lother French possessions, Guatemala, Honduras, Madagascar, Monaco, Morocco, Panama, Siam (Bangkok), Uruguay.

Sunday, July 18—Uruguay (Constitution Day).

Monday, July 19—India.

Tuesday, July 20—Brazil (State of Parahyba) Colombia.

Wednesday, July 21—Belgian Congo, Belgium.

Friday, July 23—Turkey.

Saturday, July 24—Brazil (State of Pernambuco) Colombia, Costa Rico, Portuguese East Africa. In the United States: Utah (Pioneer Day).

Sunday, July 25—Canary Islands, Porto Rica, Spain.

Monday, July 26—Liberia.

Wednesday, July 28—Brazil (State of Maranhao), Peru.

Thursday, July 29—Peru, Siam.

Friday, July 30—Japan, Peru, Siam.

New Color Reaction

A new color reaction upon stone cells and brown bast disease in Hevea brasiliensis is mentioned by C. van Zijp in the "Archief voor re Rubbercultuur."

A solution of benzidine chloride colors woody elements beautiful orange, and can therefore be used for the coloring of stone cells in Hevea bark. A section of the bark is put into a drop of benzidine chloride solution (1 gram of benzidine is dissolved in 95 cc. of distilled water, to which is added 5 cc. of hydrochloric acid of 25 per cent.) upon an object glass. By this means the stone cells are colored a beautiful orange. The highest degree of coloring is obtained after about 15 minutes. When this is reached a drop of pure glycerine should be added if the section is to be preserved.

The advantage of this coloring of woody elements over the coloring with phloroglucine-hydrochloric acid is, that the microscope is not spoiled by the hydrochloric acid vapors, which certainly takes place when phloroglucine-hydrochloric acid is used. Furthermore, benzidine is seven times cheaper than phloroglucine. Benzidine chloride surpasses aniline chloride or aniline sulphate, because it colors the woody elements more intensively.

A solution of benzidine chloride also colors the substance in the intercellular spaces of the bark, which is affected by brown bast disease, a beautiful orange. The surrounding walls are less highly colored. From the fact, that this substance becomes orange in color, we learn that it contains one or more substances, which have the benzidine chloride reaction in common with the wood substance.

Remarkable Growth of the Rubber City

Akron, the prodigy child of the automotive and rubber industries, today has the distinction of being the fastest growing large city in the United States. According to the Census Bureau, of the Department of Labor, Akron's population increased 201.8 per cent during the past decade, leaping from 69,067 in 1910 to 208,435 at present.

Few cities of more than 25,000 ever showed a population gain larger than that of Akron. In the 1900 census, not one city showed a gain of more than 200 per cent., and in the 1910 census, only two cities had that distinction. Birmingham, Ala., went from 38,415 to 132,685, an increase of 245.4 per cent., and Los Angeles, Cal., jumped from 102,479 to 319,198, a gain of 211.5 per cent.

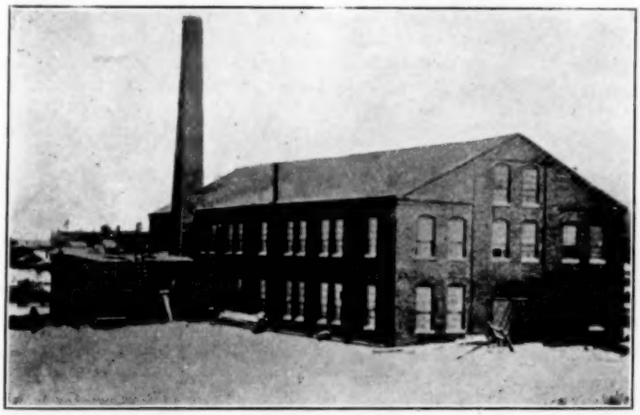
Akron's growth appears all the more remarkable when compared with the growth shown by other cities in this census. Of the cities having 100,000 or more inhabitants, not one showed an increase of more than 50 per cent. Toledo led with 44.3 per cent. Others ranged: Washington, 32.1; Dayton, 31.1; Syracuse, 25.1; Milwaukee, 22.3; Albany, 13.1, and Cincinnati, 10.3.

Factors in Akron's Growth

Credit for the phenomenal growth of Akron during the past ten years is divided between the rubber industry and the automotive industry. Each can point to Akron as proof conclusive of its greatness. Working together, these two industries lifted Akron from obscurity and placed it in its present place of eminence, high among the foremost manufacturing centers of the world.

Twenty years ago there was nothing unusual about Akron. It was a busy little city, but that was all. It was hardly known outside the state. Akron was thought of, by those who knew of its existence, as "that little city up in the hills of northern Ohio, where sewer pipe, breakfast foods, and farm implements are manufactured."

Then, suddenly, Akron began to grow. It was as though it had been touched by a magic wand. Factories sprang up almost overnight and thousands of new homes were built. The word went out that Akron was a "real town, where money could be made," and men and women began coming to the city from all sections of the country. Like in the old days when



Factory of B. F. Goodrich Co. in 1870

the adventurous and the hardy went West to seek their fortunes, they came to Akron.

During this period when Akron's growth began getting underway there were many classed the city with the "boom" towns which sprang up one day and settled down into mediocrity the next. But they were wrong. Akron's growth continued, year after year, gathering impetus with passing time; never ceasing. Akron was "on the go"—and it went.

Marvelous as the growth of Akron has been, the reasons for it can be easily defined. Ask an Akron resident why the city has leaped ahead and he will answer with one word—"rubber." Nothing more need be added—that explains it all. "Rubber" made the city; carried it to the place it holds today; made it the fastest growing city in America. The rubber industry, leaping forward into greatness, bore Akron with it and made it also great.

The automotive industry shares in the credit for making Akron because it caused the expansion in the rubber industry. When the automobile was invented a need arose for rubber tires which would prevent the machine from being jarred to pieces. Akron rubber factories supplied this need, and in so doing, expanded out of all proportion to their former size, with almost uncanny rapidity. And as the rubber factories grew, so grew Akron.

Although Akron has been before the public eye only a comparatively few years it is one of the oldest cities in Ohio. The first settlement within the territory which now comprises the

Main Street, Akron, Ohio

city was made in 1807, at Middlebury. This settlement was at a point on the Little Cuyahoga river where water was available and for many years it was the market town and commercial center of a large section of northern Ohio.

The village of Akron was founded in 1825 several miles to the west of Middlebury on the route of the Ohio and Erie canal, which linked together the Ohio River and Lake Erie. Middlebury was not on the route of the canal and residents of that settlement who foresaw the future possiblities of the water highway moved over to Akron bag and baggage.

Akron was incorporated as a town in 1836 when it joined up with Cascade, a little settlement a mile north of Akron. Middlebury was annexed in 1872, the joint population at that time being about 12,000.

Water Power and Transportation

The greatest factors in the early growth of Akron were the availability of water power and cheap canal transportation. The water power was furnished by a drop in the level of the Ohio canal at that point and by the Cascade race which diverted the water of the Little Cuyahoga river several miles out of its course. Canal transportation was provided by the Ohio canal and the Pennsylvania and Ohio, or "cross-out", canal, which started at a point on the Ohio river near Pittsburgh and ended at Akron. The cross-cut canal was started in 1835 and finished in 1840. It was in operation fifteen years, and during that period it made Akron one of the most important trade centers in the middle west and gave the city an impetus which it never lost.

Akron was incorporated as a city in 1865 after an enumeration showed it had a population of 5,066. From then on the city grew steadily, participating in the increasing activity given to commerce, manufacturing, and agriculture by the Civil War. The advent of railroads made it possible for the city to reach markets which were inaccessible before and to compete with other cities. The first railroad, a branch of the Cleveland and Pittsburgh, entered the city in 1864.

Today Akron is on the main lines of the Erie, Pennsylvania, and Baltimore & Ohio, and is connected with the Wheeling & Lake Erie by the Akron, Canton, & Youngstown, and with the New York Central by the Northern Ohio.

Prior to the twentieth century Akron acquired some measure of fame as a manufacturing center through the manufacure of clay and cereal products, farm implements, cast iron products, binder twine and matches. The industry which was destined to play the largest part in the history of the city, however, was the rubber industry. Akron became the center of this industry almost by accident.

The First Akron Rubber Factory

In 1867, Dr. Benjamin Franklin Goodrich started a rubber factory in Hastings-on-the-Hudson, New York. The venture was not a success and after a year Dr. Goodrich moved his plant to Melrose, N. Y., where he started again after securing financial help from a friend. Competition of other eastern rubber factories proved so keen, however, that this venture turned out to be as much of a failure as the other and Dr. Goodrich decided it would be advisable to relocate in the virgin fields of the west. He was attracted to Akron by an offer of financial assistance from several Akron men, and in 1870 moved his plant to that city. He started manufacturing in a building 40 by 100 feet with a force of thirty-five employes.

The company encountered only a small measure of success at first. It struggled along, often on the verge of bankruptcy. Many of the original stockholders became discouraged and dropped out. In spite of bitter discouragements, however, Dr. Goodrich "stood by the ship," and finally secured the financial assistance which enabled him to place the company on a paying basis.

In the years which followed the Goodrich company grew, not rapidly, but steadily and surely. Rubber goods came into more common use and several additions were made to the original "smelly little shop by the canal." The Goodrich company began to prosper and, encouraged by its example, other rubber companies were founded in Akron. Soon the industry was centered in the city. It remained centered there during the years which followed and even today Akron manufacturers fully half of all the rubber goods made in this country.

The rubber industry received its first great impetus when the bicycle was invented and rubber tires were needed. The bicycle manufacturers looked to Akron to be supplied and the Akron factories turned to their production. The demand was small at first but when the bicycle "craze" was it its height the factories were hard pressed to keep up with their orders.

The impetus given to the industry by the invention of the bicycle was as nothing, however, in comparison with that given when the automobile came into use. Many difficulties were encountered in manufacturing a pneumatic tire suitable for use on the heavy machines but the problem was finally solved. The first tire, which was made at the Goodrich Company, was a curious affair. It had sixteen plies of fabric and a tread an inch and a half thick. Experts say it was the best ever built and at the same time the poorest—it burned itself out before going 500 miles. Improvements on the tire came fast, however, and by the time automobiles ceased to be a luxury and became a necessity of everyday life,first-class tires were made in quantity.

Increased Demand for Tires

As the demand for automobile tires increased the Akron rubber factories expanded. Numerous additions to existing plants were made and many thousand new employes added. Each year saw new production records made and broken. In 1910, 4,000,000 tires were manufactured in the city but large as this production was it proved to be just a beginning. In 1915, 10,000,000 tires were manufactured and last year 20,000,000. Today tires are being turned out at the rate of one a second, indicating a production of at least 30,000,000 for the year.

As a result of this increase in production, a flood of gold has poured steadily into Akron, making it one of the most prosperous cities in the country. The sales of the rubber companies amounted to about $40,000,000 in 1910. In 1915, they totaled $121,085,000, and last year they jumped to $427,796,000. A large part of this income was turned over to the employes of the companies, the pay-roll last year amounting to $101,178,000.

The expansion of the rubber industry resulted in a corresponding growth of the city. In 1910, the rubber industry employed 13,631 persons. Today it employs 86,000 and the number is constantly increasing. Great difficulties have been encountered in housing the incoming thousands. Homes could not be built fast enough to supply the demand. When the war put a stop to practically all building, the situation was still further aggravated. Last year, however, great steps were taken in home construction and at present only the scarcity of building materials is preventing the work from being carried on.

Besides leading the country in population growth, Akron claims distinction for many other things. Labor troubles are practically unknown in the city, simply because the factories have always made it a policy of paying high wages and providing good working conditions. Various means have been adopted by the companies to make the employes feel that they were partners in the business rather than merely hired hands. Clubhouses and gymnasiums have been erected for the employes' use, libraries have been established, medical and dental service is furnished without charge, and assistance is given in the purchase of homes. The Akron plan of Americanization work has been adopted by the entire country and the Akron system of promoting amateur athletics in the industries has been used as a model for similar work in numerous other cities.

Akron does not intend to rest with the laurels gained in the past decade. Its industries are building extensions and making plans for increased production which will keep the city moving rapidly ahead on its upward climb. When the next census is taken in 1930 it is not only possible but probable that Akron will again show a startling growth.

The Ageing of Vulcanized Rubber

In order to ascertain these changes during the vulcanization a mixing of 92½ per cent rubber and 7½ per cent sulphur was made up and vulcanized at 148°C for 70, 90 and 110 minutes respectively. The vulcanized product was kept at 72°C and every twenty-four hours samples were taken and the physical properties determined. It was found that:—

The vulcanization curve was displaced in the same manner as would be accomplished by carrying the ordinary vulcanization still further. The variations during the first twenty-four hours were about the same the greatest variations occuring on the samples with the shortest vulcanization time. The changes on further heating are, however, practically the same for samples with vulcanizing coefficients from 2-4. The changes during the next twenty-four hours are always less, however, the samples never become constant but continue to change until they become "short" and brittle.

The tensile strength is increased in the same manner by prolonging the vulcanization. Samples with vulcanization coefficients of 2, 3 and 4 show at first an increase in the tensil strength and later become brittle and "short."

The vulcanization coefficient at temperature under 80°C show only a slight change, so that the above mentioned physical changes go hand in hand with the increased combination of sulphur with the rubber which occurs during the usual vulcanizing process, by the ageing process this chemical reaction is not shown.

The authors by many determinations have endeavored to solve the question as to whether or not the vulcanized samples show their true values twenty-four hours after vulcanizing or after seventy-two or ninety-six hours. By the experiments there was shown to be sure, a variation in the position of the vulcanization curves, however, these variations were very slight. The difference of 5-10 per cent found after three to four days corresponds to variations in the vulcanization of about two or three minutes.

The rubber samples were so vulcanized that the maximum tensile strength was obtained, so that practically no differences were found. In all cases, the constants found after twenty-four hours were practically identical with those found after two or three days.

Organizing an Employment Department

This is the Third and Final Installment of a Series Devoted to the Employment or Personnel Department. The Following Article Describes the Necessary Qualifications of a Successful Employment Manager and Analyzes the Work of the Department

The employment manager, who measures up to the new standards now being set, is a first-class executive, standing on a parity with the sales manager or the production engineer. He has the more need of talent because of the newness of his position; a circumstance which emphasizes flexibility of ideas, the ability to conduct investigations, the courage to be a pioneer, and the power of commanding the confidence of others in his pioneering. Again, his position is difficult, because he stands between parties which have been traditionally opposed to each other, namely, capital and management on the one side and labor and craftmanship on the other. He must always perform the functions of a mutual interpreter and often those of a peacemaker.

In considering a proposed occupation it is wise to present a sober view of its conditions, so that persons who lack a sufficient persistency and depth of conviction for success may be early dissuaded. Wherever there is authority there is responsibility; wherever there is reward there is struggle. If the general significance of employment management lies in its accord with the progressive tendencies of the age, the greater part of the energies of the individual employment manager is absorbed by the practical problems of finding enough workmen, of supervising records, and of hearing and adjusting complaints. It may be the lot of an employment officer to deal with a heard-headed proprietor, who is habituated to take the defensive against new plans. He may encounter the open or concealed opposition of foremen who for the sake of prestige, cling to functions they cannot properly perform. He may find organized labor cold to benefits which the unions have not won, and which look toward the substitution of a vertical bond, uniting employer and employed, for the horizontal union of employes of different establishments.

Leadership Necessary to Success

All of this means that the successful employment manager must be a person exceptionally fitted for leadership. He needs good native ability, made serviceable by adequate general and special training. He should possess a well-balanced and absolutely impartial judgment. It is a powerful aid if he posseesses humanitarian instincts and a sympathetic disposition. These must, however, be real attributes, and not a mere pose or policy, for no deception will long blind those with whom he is associated.

The person who measures himself for this profession should be able to find indubitable testimony as to the strength of his character, in the quality and amount of his achievements, and in the regard he has been able to earn from responsible persons with whom he had been associated. He should find in himself also the ability to understand human nature, not through the absurd practices of some quackery of phrenology and physiognomy, but by having analyzed his own nature, and having found therein the instincts and emotions which illuminate for him the motives and passion of others.

With these endowments the employment manager should couple sufficient education to avoid embarrassment in the oral or written use of his mother tongue. His education should enable him to understand the use of general principles, avoiding the pitfalls into which the so-called "practical" man has usually fallen when he complains of "theories." And this education should have had a wide enough scope to enable him to meet the minds of others, and cement frendships, in a world of ideas larger than the details of his work.

Finally, the employment manager is perfected for the practice of his art by general industrial experience and (if the position in view be in a manufacturing establishment) by actual contact with shop problems. This shop experience is useful to make the candidate familiar with factory tools, machinery, equipment, materials, and processes. It will instruct him, as no form of systematic training can do, in the meaning of factory life, the significance of its discipline, the meaning of its schedule of hours in terms of fatigue, and in the attitude of the worker to his job, his boss, his fellow worker, and to life in general. Any general social experience which the candidate may have had, which has taught him how to deal with people, not as individuals only but in the various forms of voluntary organization, will have value.

It may be remarked concerning untrained candidates for an important position that those who are best qualified by nature and general education will usually possess a certain insight which gives them warning of future difficulties, and makes them willing to take preliminary training, and to work at first in subordinate positions. Those without this insight are likely to argue that training is unnecessary, and that they are qualified to take at once responsible posts. Thus the line is illustrated, "Fools rush in where angels fear to tread."

High Standard of Ability

It is not to be expected that every candidate will be ideal in all particulars. Special merits may offset deficiencies, within reasonable limits, bearing in mind always that defects of native endowment are less remediable than those of education and experience. If the employment clerk and the labor scout of the past are to give way, and personnel relations in industry be placed upon a new footing by an executive officer who is able to formulate adequate policies and bear large responsibilities, a high standard of ability must be maintained for the new profession.

To summarize the matter of qualifications we give the relative weights which a number of successful employment managers have agreed upon for five principal factors:

	Per cent.
Personality	35
General industrial experience	25
Executive experience	20
Shop experience(for employment managers in manufacturing establishments)	15
Experience with organized social movements	5
Total	100

Major and Minor Functions

To indicate the scope of the activities of personnel work in industry a brief analysis may be made of the subject, dividing it into its major and minor component parts:

Organization and equipment of an employment department:

Causes which have produced the need of employment management.

Functions of employment departments.

The administrative organization of a department.

Relations to other departments of a business.

Types of records and reports used in labor accounting—Forms—Office management.

Layout of an employment department.

The employing of the worker:

Job specification.

Analysis of the labor market and its sources of supply.

Problems of dilution.

The selection of employes—Physical examinations—Mental tests.

Discharging, paying off, and the collection of control statistics.

Definition of labor turnover and its calculation.

The law of the labor contract.

The training of the worker:

Apprenticeship indentures and schools—Vestibule schools—Americanization.

The psychology of the presentation of the task to the worker.

The payment of the worker:

Wage setting—Minimum wages and the cost of living—Wage scale formation—Technique of wage paying.

Promotions and deferred benefits.

The control of working conditions:

Health, hygiene, sanitation, medical aid, fatigue, mental strain, motion study.

Working hours and rest periods.

Problems connected with the introduction of women into industry.

Efforts to keep the worker up to standard:

Accidents, accident prevention, insurance, and workmen's compensation.

Canteen or restaurant economics.

Local transportation—Community efficiency.

Housing—Home conditions.

Recreation and its effect upon productive energy.

Thrift, loans, relief, and legal aid.

Pensions and the problem of the aged worker.

The relation of the employment manager to local and State agencies.

The government of the shop:

Shop rules, rule books, foremanizing, absenteeism.

Suggestion systems and the treatment of complaints.

The organization of shop committees and their functions.

Collective bargaining contracts and procedure.

Associations of employes.

The ultimate bases of discipline and loyalty.

Organization As a Function of Conditions

The internal organization of an employment department depends, of course, upon the size of the plant and the emphasis placed by the general manager upon the various phases agreed upon. It is affected also by the nature of the work, by the location of the factory, by the relative number of men and women employes, by the percentage of foreign-born workmen, and by the degree of organization or cohesive thinking among the workers.

It is economical for a plant of 200 workers to have a separate employment department. A smaller plant may have to combine the functions of the employment manager, those of the chief timekeeper, or the cashier, and engage a physician for several hours a week, and otherwise merely approximate a separate department.

It is impossible to allow in a general description of the functions due to the different conditions here mentioned. It is of value for a plant that may still be too small to establish a complete organization to plan one on paper, in order that as the force increases the department can grow with it in accordance with an outline.

Fuctions in Terms of Personnel

Such a plan would consider the functional organization which would assign no less than one person to each major function.

The following is merely a suggestive list. No given plant will have exactly this line-up, use exactly these titles, or assign the functions in exactly this way. The personality and previous experience of each staff member will have as much to do with the division of duties as the requirements of the particular plant:

1. Employment manager, to supervise the whole department.
2. Assistant employment manager, to handle complaints, adjustments of pay, and other wage questions, and interviews with quits.
3. Preliminary interviewer.
4. Final interviewer.
5. Absentee visitor.
6. Woman assistant employment manager, to deal with women employes, study living conditions and costs, and answer questionnaires.
7. Medical supervisor—a physician to make physical examinations and consider hygiene and sanitation.
8. Safety engineer.
9. Factory nurse. (May be alternate with absentee visitor or combine both offices.)
10. An engineer to write job specifications, consider the justice of tasks set, and standardize and classify jobs. He may also, if properly trained, devise trade tests and psychological examinations and assist the plant instructor.
11. Educational director, to conduct vestibule school, with such assistants as may be assigned from the shop.
12. Restaurant manager, who may combine duties in connection with a cooperative store, mutual benefit society or other business institution in the service department.
13. Recreation worker—athletic instructor or organizer.
14. Records clerk or clerks.
15. Application clerk, to write up new employes.
16. Messengers to introduce new employes to the departments.
17. Chauffeur or motorcycle messenger.
18. Clerk for badges, locker keys, etc. (May be combined with one of the other clerkships.)
19. Watchmen, if plant-protection work is assigned to the employment department.

Bureaus of an Employment Department

But neither this nor any similar division of duties will depart far from the requirements of the normal division of functions, which will include the following bureaus:

1. *Employment proper.*—This will include interviewing, writing-up, trade tests, physical examinations, job specifications and related activities.

2. *Adjustments bureau.*—This is confined mainly to the grievances and other problems of the assistant employment manager. It may also include discipline of any character, including the supervision of the absentee visitor.

3. *Medical service and compensation division.*—It is equally logical to include physical examinations, which have been mentioned under employment. Every other phase of medical work certainly comes in this division.

4. *Educational division.*—This may be confined to the vestibule school or relations with city schools, or it may include also more general educational work with employes.

5. *Social-service division.*—It is convenient to group here the restaurant, the mutual benefit society, and other service institutions, and any individual work with employes, as well as athletics, social clubs, housing plans, etc. This bureau may be further subdivided.

6. *Safety division.*—This usually comes under the employment department, and often includes compensation reports and relations, which have been mentioned under medical service.

7. *Records division.*—This includes reports on labor turnover and all other records of the department save medical reports, which are properly confidential and are kept by the physician.

8. An eighth division or bureau is added if plant protection is added to employment work.

Chart of administrative relations.—The grouping of the staff workers does not fall sharply into conformity with this grouping of bureaus, because anyone may have a responsibility for work under several divisions, as, for instance, the woman assistant employment manager. But a chart can be drawn to show the major relations.

Chart of functions.—The functions of an employment department can be regrouped and charted in a slightly different way to accord with certain idea-relationships that do not exactly correspond with the logical division of bureaus showing the two main purposes of educational work, getting and improving and assigning good workers, or force maintenance, and the personal relations phases designed to improve shop morals. This chart is, therefore, not so much a chart of functions as of aims.

Literature

Fortunately there is now a considerable body of literature available to the person who would inform himself. It should be remembered, however, that mere reading is not study, and that even earnest study only yields correct conceptions. It is experience alone which teaches use the uncommunicable art of applying the powers of our personality in the pursuit of a course of conduct which receives its guidance from our conceptions. There is a great difference between being informed on a group of subjects and being expert in the practice of an art or profession.

Proofing Airship Fabric

By Guy Barr, B. A. B. Cc.

The tests here described were undertaken in order to obtain information in answer to the following questions:—

(1) Whether the fabric sent (B. 29) is liable to become ignited owing to gunfire, and the result of a smouldering wad falling on it.

(2.) The best fire-proofing material to employ to prevent the fabric becoming ignited, and the effect of this material on the strength and permeability of the fabric, both when new and after weathering.

(1) The fabric was of treble cotton and rubber, and had been doped on the exterior surface with aluminum dust suspended in "soluble gun-cotton." The results of the various tests made were compared with those of similar tests performed on an ordinary yellow treble balloon fabric.

Gunfire is presumably most likely to cause ignition of the fabric at point-blank range. The duration of the flame at the mouth of a rifle may be guessed as some fraction of a second. The temperature of the flame is not likely to be appreciably higher than that of an air coal-gas blowpipe flame. It was found that three seconds exposure to the hottest of this flame was required to cause ignition of either of the fabrics. The actual size of the blowpipe flame made practically no difference to the result. .Hence it is extremely improbable that rifle fire could cause ignition of the fabric.

In this connection it may be appropriate to remark that collodion is not very rapidly ignited by ordinary sources of heat. It is true that once alight the combustion is fierce, but the temperature required for ignition is not low. The small quantity of collodion in the dope is not sufficient to make any noticeable difference to the burning of the fabric.

Further, a rubbered fabric does not continue to burn if locally sparked, unless the heat supplied by the lighting agent plus that due to the small quantity of fabric consumed is sufficient to cause decomposition of the subjacent rubber. If the heat reaching the rubber is at any point too small to cause the distillation of volatile vapors therefrom, the conflagration is not transmitted to that point. The combustion of rubber requires a very much greater volume of air than that of cotton, and the supply of air being limited, the diffusion of the inflammable rubber decomposition products is the preponderating agent in the spread of the fire.

(2) Bearing in mind the above facts, it was improbable that efficient fire-proofing would be secured by any of the usual materials employed for rendering cotton non-inflammable, particularly if these could be applied only to the outer layer of cotton, the other two layers being waterproofed. This view was confirmed by soaking a piece of yellow treble fabric in a solution of alum. No difference in the resistance to the attack of a smoldering wad was observed.

The wads used for these comparisons were made by cutting out discs of cardboard of the correct diameter from a sheet of such thickness that the effect of placing one of these discs on a piece of balloon fabric was the same as that caused by wads removed from a few .303 inch cartridges.

Comparison of Fabrics

When the treble yellow fabric was compared with B. 29, it was found that the former was occasionally burnt completely through by the smoldering wad, and nearly always damaged as far as the innermost cotton layer; with B. 29 the dope was not only not a source of danger in this respect, but the fabric was actually somewhat protected . A wad would occasionally damage the innermost layer, but usually the outer two layers were alone attacked, and in no case was a hole burned right through. These results were further confirmed in the presence of hydrogen confined under a pressure of about an inch-and-a-half of water by a piece of the fabric attached to a suitable vessel. In spite of repeated attempts the fabrics were not burnt through by the wad in either case, and even when, by the successive application of three or four wads, a hole had been burned, the gas which escaped did not catch fire. In fact, wads smoldering with sufficient energy to cause their complete combustion were found to be unable, at any rate in the half-dozen tests made under laboratory conditions, to ignite hydrogen or hydrogen-air mixtures.

In the above cases the damage done to the fabric by a smoldering wad was sufficient to cause a considerable local reduction of strength, together with a good deal of softening of the rubber. The position of the damage was, of course, readily visible by the blackening of the yellow fabric, but the aluminum doped B. 29 showed very little trace of the incident on a cursory examination. It was only when the burnt spot was rubbed with a pencil or other moderately hard body that the white film of metallic powder was removed, and the scorching rendered visible.

Fire Resistance of Fabrics

The resistance to fire of these fabrics is thus somewhat small, nor can any considerable protection be expected, as was pointed out above, from any ordinary fireproofing, however efficient, applied to the different plies of cotton. On the other hand, in view of the quantity of rubber present, and of the fact that the temperature of decomposition would not be materially raised by the addition of any mineral matter unless in prohibitive amount, it seemed useless to make investigations in this direction. After consideration it was decided that the most promising method of attack lay in the provision of an outer metallic coating. The attachment of metal foil appeared to offer almost insuperable difficulties, but the following method of procedure was found to afford a very gratifying measure of resistance to ignition by smoldering:—

Various inventors have, during the last few years, occupied themselves with the problem of spraying metallic coatings on to woodwork, ironwork, etc., with the idea of forming a coat to resist atmospheric influences. The latest and most practical apparatus for the purpose is one due to Schoop, some details of the use of which are given in a paper by Morcom (Institute of Metals). One of the "pistols" required for the spraying has been procured by the laboratory; the other requisites are supplies of compressed hydrogen, oxygen and air, together with a length of wire of the metal to be sprayed. The principle of the method is briefly the feeding of a wire of the metal to an oxy-hydrogen blowpipe flame, where the molten metal is atomized by a blast of air external to and concentric with the oxy-hydrogen flame. The particles of molten metal are rapidly cooled by the air-blast, and reach the surface to be coated at a temperature very slightly above or possibly below their melting-point; in virtue of their velocity, and perhaps also of their high temperature, they adhere firmly to the object coated. The cooling and scattering is sufficient to ensure that no undue rise of temperature occurs on the sprayed surface. Some practice is required before the apparatus can be used satisfactorily, and the sample prepared at the laboratory does not necessarily represent the best or most uniform coating which can be applied.

A small sample of single rubbered fabric was sprayed with aluminum by this process in order to see whether the fire-proofing was of any value. It was found that a smoldering wad which would burn a hole through a treble fabric scarcely affected this sample beyond slightly softening a small portion of the rubber. The tensile strength of the sample was not affected by the spraying. It is therefore evident that the metallic particles are sufficiently small and well-cooled to do no damage to the cotton. This being the case, it is reasonable to conclude that the rubber, and hence the permeability will also be unaffected.

* Reports and Memoranda, No. 178, (British) Advisory Committee for Aeronautics

As regards the other properties of the coating, the following remarks may be made:—

(1) The additional weight per square metre is about 100 g. in the sample prepared here. Experience in the use of the process, and possible slight modifications in the dimensions of the apparatus, air pressure, etc., will in all probability reduce this figure very considerably—e. g., our first attempt gave a coating half as heavy again as our second.

(2) The outer cotton layer may, with possible advantages from the point of view of prevention of accidental local rise of temperature during the process, be moistened thoroughly before spraying; the adherence and other properties of the coating are in no wise vitiated by this precaution.

(3) As prepared here the coating is not waterproof, and in this respect is inferior to the existing dopes, etc., when the latter are in good condition. The amount of moisture adhering will probably, however, be reduced by the use of a finer spray.

(4) Since the heat conductivity of the coating is presumably the cause of the efficient protection from fire, it appeared likely that the electrical conductivity might also be considerable. It was found that the resistance was extremely small, e. g., a 100-volt lamp burned with undiminished brilliance when the circuit included a couple of feet of the fabric of two inches in width. This point is of some interest, and perhaps of great importance in view of the conclusions reached on the question of the best method of securing practical immunity from accidents due to electrostatic charges on the envelope. The process may prove to be of use in many other fields where it is desired to improve the electrical conductivity, e. g., of a rope or board.

(5) Though the behavior of the coated fabric is very satisfactory as regards resistance to scorching and smoldering, it is not suggested that it is rendered absolutely non-inflammable. If a flame acts on the fabric for a time sufficient to cause ignition the burning of the fabric is just as energetic as when burnt without the coating.

The adiathermancy of the coated fabric has not been examined, but since the coating is fairly bright, this is probably equal or superior to that of the usual aluminum dopes. The resistance to weathering has not, of course, been examined, but should be at least as good as that of the ordinary yellow fabric.

Foreign Trade Marks in Brazil

By G. B. Johnston

Manufacturers who are already doing business in Brazil, or who hope to be interested in this market in the future should lose no time in having their trade-marks registered here. It is desirable to go into this matter in some detail in order to point out the necessity of such early registration for the protection of their immediate and future interests.

From the point of view of foreign manufacturers the present trade-mark laws in Brazil are unsatisfactory. Revision of the law is generally recognized as necessary, but it appears that such a revision at the present time is unlikely because of the unsettled conditions following the war.

As the law now stands it is possible for any one to register a trade-mark in the federal capital (Rio de Janeiro). Only thirty-five days, counting from the publication of the mark in the *Diario Official*, is allowed for interested parties residing abroad to interpose their protest against such registration granted by the Board of Trade (a semi-official organization which has the duty of registering trade-marks for the republic). If the interested party should be unable to avail himself of this period allowed for opposition to the registration, he has the right to raise an action for cancellation of the trade-mark in which he is concerned. For this purpose a period of six months is allowed. It is natural that usurpers of trade-marks, knowing the provisions of the law, take the precaution not to make use of them during these six months. Afterward, having acquired the right to the marks by fradulent means, they have not only the right to the marks, but also the right to prosecute the legitimate proprietor if he attempts to sell goods bearing his own mark.

A joint memorial of the British and American Chambers of Commerce in Rio was recently sent to the Brazilian Commercial Association pointing out these evils and suggesting that the period of thirty-five days should be extended to six months, and the period allowed for an action of cancellation should be extended to two years. It was further pointed out that one evil of the present trade-mark situation which assumes capital importance is that respecting the incapacity imposed by the law on the Rio de Janeiro Board of Trade (who registers all federal trade-marks) to refuse "deposit" or registration of trade-marks already registered in the capitals of the states when they infringe other trade-marks already registered by the Board of Trade by reason of their similarity or identity. It is easy to understand the result of this incapacity, which gives rise to a situation absolutely prohibited by the legislation of every country, even Brazil itself, such as the legal duplication of a trade-mark, leading to confusion and possible losses.

To appreciate this last point it is necessary to understand that the constitution and political divisions of the United States of Brazil are founded on those of the United States of North America. Brazil is a federal union of twenty-one sovereign independent states, one territory and one federal district. The central or Federal Government of Brazil at Rio de Janeiro has allowed to it by the constitution certain defined functions of government. All other powers not so defined remain in the hands of the several states. Among the former is, of course, the treaty-making power, within the scope of which would be included any international agreement relating to trade-marks. It is not unnatural to suppose that foreign trade-marks, registered at the Board of Trade under the authority of the Federal Government, the only treaty-making power and the only power in the country with authority to deal with foreign affairs, would be amply protected by such registration. The states, however, reserve to themselves the right to register trade-marks in their own teritory, such trade-marks being required by law to be "deposited" with the Board of Trade in Rio de Janeiro. Hence one aim of the memorial mentioned above—that the Board of Trade will be provided with the power to refuse such "deposits" of trade-marks registered in the state capitals when such trade-marks are already registered in the federal district (Rio de Janeiro).

To secure full and absolute protection it would be necessary to register in Rio de Janeiro and all the state capitals as well. As a matter of fact, no company is in existence which has done so. For firms in general it would be probably sufficient to register in the federal capital only. When business assumes sufficient importance to make the trade-mark, brand or name, better known, and therefore of increasing value, the question of possible state registration should be considered, although by that time it is to be hoped that the present evils will no longer exist. In any case, for most manufacturers, in view of the doubtful necessity for state registration at all, a registration in the State of Sao Paulo in addition to the one in Rio de Janeiro would probably be sufficient protection.

Firms who desire to register their trade-marks can employ any one of a number of firms in Rio de Janeiro who specialize in this business. One firm in particular charges a fee of Rs. 170,000 (170 milreis), or about $50 at the present rate of exchange. The papers required are a certified copy of the firm's registration certificate, ten prints of their work, and a completed copy of the Procuraco obtained in blank form there. A power of attorney is also necessary, legalized by a Braziilan consular officer. This power must be left blank in order that it may be properly completed in Portuguese, and will serve for any number of trade-marks of the same applicant, even though the applications are filed at different dates. The registration is good for fifteen years.

Goodyear California Plant Opened

New Factory of Akron Firm Holds Formal Opening on June 14—Plant Opened in Less Than One Year After Beginning of Building Operations

Los Angeles became the industrial metropolis of the West on June 14th with the formal opening of the California plant of the Goodyear Tire and Rubber Company.

The opening took place ten months and two days after the ground had been broken for the $20,000,000.00 project, and officials from Akron and the California Company were present to help turn out the fifty tires that were made the first day of operation. It is estimated that the capacity of the new plant will be 500 tires a day within a month. There are 2000 employed at present including 700 in the factory and general office. Ultimately, the company hopes to employ 9000 people and turn out 7500 tires a day.

Los Angeles helped the company celebrate the opening of the plant by a general celebration. There was a blowing of whistles, and a general jollification throughout the city.

Ground Broken in July 1919

Officials of the company began early in 1919 to investigate possible sites for the establishment of a big Goodyear plant in the West, and Los Angeles was selected as combining the greatest number of the favorable conditions required. There were other cities that offered a few of the advantages for which the company sought, notably, the distribution advantages of San Francisco and San Diego, but Los Angeles provided the greatest number of favorable conditions. Among these were an ample supply of labor that could be used under agreeable industrial conditions, good railroad distribution facilities, a good port for receiving crude rubber from the Goodyear rubber plantations in Sumatra across the Pacific, its proximity to the Salt River Valley in Arizona and the Imperial Valley in Southern California, and the possibility of securing an ample supply of water and fuel oil.

A 622 acre tract of land was purchased in Ascot Park, about four miles from the center of the city.

Ground for this great western enterprise was broken in July 1919, by President F. A. Seiberling of the Goodyear company, and immediately afterward the engineers and construction men set about to complete the building of the plant.

The building scheme embraces the construction of three units—a tire manufacturing plant, a cotton fabric mill and a warehouse. Around these three main buildings will be grouped the various service buildings, such as the power house, machine shop, cement house, administration building, etc. Among the important materials which 2000 men are fashioning together into a mammoth industrial enterprise, are 6000 tons of structural steel, 15,000 gallons of paint, 33,000 tons of sand, 60,000 barrels of cement, 600,000 tons of crushed rock, 4,000,000 feet of lumber and 10,000,000 brick.

The tire manufacturing plant construction is of steel and concrete. The building is three stories high, 58 feet lond and 300 feet wide. The cotton mill which will be operated by The Goodyear Textile Mills Company, is three stories high, of reinforced concrete, 580 feet long and 134 feet wide. The warehouse is a three story reinforced concrete building with a mezzanine floor.

The power plant, housed in a reinforced concrete building, embraces three 600 horsepower boilers of the oil-burning type. A crude oil storage tank containing 70,000 cubic feet of space is being built to take care of the fuel wants of the power plant.

One of the most important considerations in the establishment of a big manufacturing concern in any locality is the assurance of an ample water supply. The availability of a sufficient supply of water was one of the important elements that entered into the selection of Los Angeles as the seat of Goodyear's western activities. Four wells are being constructed to a depth of 200 feet, each of which will have a pumping capacity of 1,200 gallons per minute.

The operation of the two manufacturing units, the tire plant and the cotton mill, will involve the employment of about 9,000 workmen. The total tire output will approximate 7,500, daily, and the cotton mill will turn out weekly 75,000 pounds of cord fabric, and 75,000 pounds of woven fabric.

The raw cotton from which this fabric is to be manufactured will come from the Goodyear plantations in the Salt River Valley in Arizona, and from the Imperial Valley of Southern California where the company has made arrangements with cotton growers.

Mammoth Housing Project

A feature of the Goodyear project is the mammoth housing plan which will be put into operation to provide homes for its workmen. President Seiberling has held through many years of business life, that the happiest and most contented workman is the man who owns his own home. Several years ago he conceived the idea of utilizing a tract of land just east of the big Goodyear plant in Akron, Ohio, as a community for home builders among his employes. In Los Angeles, where the land is comparatively level, and where there is so much opportunity to utilize a wide range of semi-tropical vegitation in beautifying the tract, the home community will be known as the Goodyear Gardens. The building of the houses will be financed by the company, but each employe may select his lot and exercise his own taste in the arrangement and architecture of his house, making payment in monthly installments according to his ability to pay.

All will embody certain features of architectural design making for harmony when grouped in one great community. The main thoroughfare— Goodyear Avenue—runs diagonally through the tract, dividing in the center of the Gardens to surround a spacious diamond-shaped park, which will contain playgrounds for children and various community houses. Provision is also made for a gymnasium, swimming pool, shelter house, pavilion, school, library, churches and stores.

All of the activities connected with the development of this home building project will be carried on by the Goodyear Gardens Company.

An important element in holding together its vast army in a close bond is an extensive program of social and athletic activities. This is all directed by a central committee composed of representatives from the various departments of the plant.

Just south of the Goodyear Gardens, sufficient land has been reserved to provide for a large athletic field for the extensive array of athletic activities that will be started when the factory gets into production.

All of the athletic and social activities of the Goodyear family are open to all, and that the presence of this spirit is actual and not theoretical, is proven in the participation of the officials of the company at the various functions.

Aviation Center Planned

It is the aim of the Goodyear Tire and Rubber Company of California to make Los Angeles one of the important aviation centers of the world and a tract of 320 acres has been set aside south of the main plant for a big aviation field equipped to take care of both heavier-than-air and lighter-than-air types of craft. A hangar has just been completed to house the "Pony Blimp." This "Pony Blimp" will serve as a nucleus around which the Goodyear aviation program will develop.

The aviation field has been offered to the City of Los Angeles as a municipal landing field and as such has been accepted. Suitable hangars will be erected to take care of different types of aircraft at this field. It is also expected that the field will be used as an intermediate landing place by the air service of the Western Department of the army, as well as for other craft desiring to use the field as an intermediate station. Arrangements are being made to furnish supplies, such as gasoline, oil, hydrogen and gas.

With Los Angeles as an aerial headquarters it is possible to establish such schedules as these in passenger or freight service. El Paso, twelve hours; Portland, fifteen hours; Honolulu, six hours; Manila, sixty hours; China and Australia, four days.

The first actual aerial service, however, to be established by the Goodyear will operate between Los Angeles and Phoenix, Arizona, where the company's cotton plantations are located, for the transportation of mail and passengers between these two points.

Mid-West Association Bulletins

The following bulletins were recently issued by the Mid-West Rubber Manufacturers Association:

Employment in Automobile Industry

To Members:

According to figures just issued by the Bureau of Statistics of the Department of Labor in regard to the volume of employment in thirteen selected industries, it is shown that in 39 automobile manufacturing plants reporting for both the months of April, 1919, and April, 1920 there were 106,337 employes on the payroll in April, 1919, and 136,429 in April, 1920—an increase of 28.3 per cent.

The payroll of the same plants in April, 1919, amounted to $3,088,919 and in April, 1920, to $4,524,146—an increase of 46.3 per cent.

A comparison of the months of March, 1920, and April, 1920, however, in 38 automobile manufacturing plants shows a decrease in the number on payroll and in the amount of the payroll.

The figures are as follows: March, 1920, number on payroll 130,716, April, 1920, 128,445—a decrease of 1.7 per cent. Amount of payroll March, 1920, $4,417,822, April, 1920, $4,246,399—a decrease of 3.9 per cent.

It is reported that May statistics in the automobile industry will be likely to show 30 per cent reduction over April.

Some Difficulties of Doing Business Today

June 17, 1920

To Members:

William A. Law, president of the First National Bank of Philadelphia, in that bank's bulletin, says:

It was never more difficult to do business than it is today. The mail service between Philadelphia and New York is so unreliable that special delivery matter mailed in the afternoon is not sure of delivery to Wall Street banks in time to get the items into the clearing house the next morning. This seems incredible for the distance is only ninety miles and two splendidly equipped railroads furnish as fine and expeditious train service as anywhere in the world. In order to save a full day's interest charge in the collection of an enormous volume of exchange, therefore, some large Philadelphia banks now send over these checks every day by special messengers. That this should be necessary in a highly developed railroad territory would be ludicrous were it not for the light it throws upon the low efficiency of the postal service in a densely populated area. It may be doubted if any similarly located cities produce more valuable mail than is carried between Philadelphia and New York 365 days in the year. Why, then, should it be necessary for the banks to undertake the work that the Government is paid to do in a territory of enormous business activity? The incident is suggestive of the things which are bearing heavily upon the people at the time when the greatest need exists for the quickest transmission of intelligence and business mail between the centers of trade activity. Day to day operations show that it takes from thirty-six to forty-five hours to deliver Philadelphia mail in suburban towns around New York, while distribution within New York City limits is sometimes almost as slow.

At a time when commercial discounts are quoted at 7 per cent by the Federal Reserve Bank of New York a bad mail service between these two great cities becomes mighty costly to Philadelphia interests. The naming of that rediscount rate by the Federal Reserve Banks of New York and Chicago emphasized the credit strain as almost nothing else has since the war ended. The Philadelphia Federal Reserve Bank has not followed this advance, one reason being, no doubt, the restrictions in the law which prevent charging more than 6 per cent for accommodation. The banks of all cities, however, are finding it necessary to discriminate sharply between non-essential loans and those whose proceeds are to be productively employed. This is a safety measure of great importance and means much for the safeguarding of constructive enterprise. There is much less to be alarmed about in the present credit situation than before the adoption of these expedients to curtail accommodation to borrowers upon speculative collateral.

No Campaign for Early Buying of Coal

June 19, 1920

To Members:

The Council of National Defense has decided not to initiate its proposed campaign to urge early buying and storing of coal, it was learned this week. This action was taken as at the present time the demand for coal is greater than the supply and such a campaign would tend to further increase the demand, it is reported.

U. S. Bituminous Coal Commission

The United States Bituminous Coal Commission has asked many large industrial consumers of bituminous coal to cooperate with it in furnishing reports as to present and future requirements in order that the exact extent of weekly production may be gauged.

The congestion of railroad traffic resulting from the switchmen's strike and other reasons has caused an acute shortage of coal cars at the mines and has also retarded the movement of created coal cars to destination. As a consequence spot prices have increased and anxiety has been expressed concerning the supply of coal for next winter. The United States Bituminous Coal Commission, acting in cooperation with the United States Geological Survey which compiles coal statistics, therefore, believes that a quick survey should be made of the present extent of consumers, stocks and and probable requirements of coal to supply current needs for the next six months and also to bring reserves up to normal. Such information will furnish a basis for a definite, practicable program of necessary weekly production which can be presented to the railroads, the coal operators, and the mine workers, in the interests of the general public, the Commission states. A list of consumers has been requested by these Government agencies to furnish as soon as possible to information asked for on the blanks which have been furnished them for that purpose. The report, which it is understood is to be held strictly confidential, calls for the following information: stocks on hand February 29, 1920; coal received March 1 to May 31, coal consumed March 1 to May 31, estimated yard losses, stock shrinkage, fire losses, etc., stocks on hand May 31, estimated consumption, June 1 to November 30, usual and normal stock as of November 30.

Better Tire Cottons

Outlining the work in his department in helping in the development of the rubber tire industry, E. T. Meredith, Secretary of Agriculture, said in an address before the Associated Advertising Clubs of the World in convention at Indianapolis: "Take automobile tires. The Department of Agriculture is doing a great deal of work toward developing adequate supplies of long staple cotton, used in their manufacture. It brought from Egypt a cotton called Egyptian cotton, but no Egyptian would recognize it today. By careful breeding and selection, the specialists have developed a long staple cotton, probably the best cotton in the world, and one that adds greatly to the length and life of every fabric made from it. It is becoming indispensable in the manufacture of good automobile tires. Twenty million dollars worth of it was produced last year in the desert country of the Southwest where practically nothing grew before; and the production will probably increase greatly this year."

Overman to Increase Capital

A special meeting of the stockholders of the Overman Cushion Tire Company, Inc., Boston, Mass., has been called for June 22 to vote upon an increase in the capital stock from $550,000, consisting of 5500 shares of a par value of $100 each, of which 1500 shares are common and 4000 shares preferred stock, to $900,000, composed of 5000 shares of common and 4000 shares of preferred of a par value of $100. Stockholders also will be asked to fix the price at which the new common stock shall be issued and the time in which they may exercise their right to subscribe to their proportionate share of the new stock.

Southland Tire Builds

Construction of the Southland tire factory, at Fort Worth, Texas, suspended during the war, has been resumed by the Texas Motor Car Association which has taken over the enterprise, and is due to be completed within ninety days.

The first unit of the tire factory will represent an investment of $350,000 a representative of the Motor Car Association said recently. The machinery, which is on hand ready for installation, cost $250,000, it was said, and the building $100,000.

The building adjoins the motor car factory on the Cleburne road south of the city and is of reinforced concrete, 50 by 100 feet and one story high with basement. The "saw-teeth" lighting system and modern steel windows will be installed.

News from the Trade at Large

New Colorado Oxide Plant—Machinery Firm Changes Name—Akron Rubber Mold Builds—Advance Enlarges Plant—McElrath Tire to Build—Wishnick-Tumpeer Chemical Co. Formed

New Colorado Oxide Plant

Announcement has been made that ores are now being roasted in the Empire Zinc Company's new Canon City, Colorado, Plant, preparatory to actual production of this material. The concern is a subsidiary of the New Jersey Zinc Company. Construction work on its new furnaces at this point was started only four months ago, but progress has since been rapid despite serious obstacles.

One of this plant's most important features is the general architectural design which permits further and almost unlimited future additions to be made, and without noticeable loss of time. Trackage facilities, now under way, contemplate such expansion. The location also is strategic with respect to such a program, as the surrounding properties are adequate to accomodate required extensions in the future

Considering the difficulty encountered in securing materials and supplies, a not over-abundancy of labor and adverse weather conditions, the achievement of the last four months indicates the completion of the entire plant at a comparatively early date. The excavations and foundations were completed sooner than expected.

The Canon City plant is modeled along lines similar to those of the zinc oxide plants owned and operated by the New Jersey Zinc Company (of Pa.) at Palmerton, Pa. The same grade of zinc oxide produced at Palmerton will be manufactured in the Colorado plant, and the continued uniform quality of this pigment, one of the features upon which the company has builded its reputation, will be assured by the process involved, and with the character of ores to be used.

That this plant is to become an important unit in the New Jersey Zinc Company's zinc oxide operations is indicated by the permanent character of construction. High grade materials are used throughout and the type of blocks installed is similar to that employed in the Palmerton furnaces and which has kept pace with the most modern trend in design.

The traveling and locomotive cranes, as well as other equipment and facilities, are of ample capacity to provide for future requirements. These were designed to enable the most economical handling of raw ores, and to facilitate the production of oxide at as low a cost as is consistent with high quality. It will be of interest, in this connection, to observe that the specifications for the new plant dovetail admirably with the ore refining operation at that point, so that a supply of dependable ores will be at all times assured.

Inasmuch as the railway situation has been so uncertain and so critical for sometime, it would be unsafe to forecast the date when manufacturing operations will start in the completed plant. Progress made up to now, however, presages an early completion of construction. The day when actual production of zinc oxide is to begin in all of these new furnaces may be even nearer at hand than is now anticipated. If past accomplishment is maintained without serious interruption, full capacity production will be a fact by early fall.

Machinery Firm Changes Name

The Taylor, Vaughn & Taylor Co., engineers and manufacturers of wire, rubber and chain machinery at Cuyahoga Falls, Ohio, has changed its corporate name to The Vaughn Machinery Co. There is no change in management, control or location and the complete line of Vaughn machinery will be manufactured as heretofore.

The new name supplements very well the trade name Vaughn Machinery, established several years ago. C. W. Vaughn continues as president and treasurer of the company and L. A. Vaughn continues as secretary and general manager.

Akron Rubber Mold Builds

Ground has been broken for extensive additions to the plant of the Akron Rubber Mold & Machine Co., makers of "Akron Rubbermold" Tire Building and Tire Repair Equipment, Akron, Ohio. The present facilities of this company, which already covers over 75,000 square feet of floor space, will be more than doubled with this extension. Heavy demands for the company's product have made it necessary to double the factory capacity. These demands have not only been from the tire building and tire repair trade in this country, but the company is making more foreign shipments now than ever before in the history of the company. New machinery ordered long in advance for the new buildings, is now arriving, some of which is being temporarily installed in present quarters, increasing present capacity.

Advance Tire Enlarges Plant

On account of the increasing demand for its fabric tires the Advance Rubber Company, Eighth avenue and Eighteenth street, Brooklyn, N. Y., has erected a new and model tire plant which will be occupied on or about July 1. The new plant will be located at 21-23 Gardner avenue, near Flushing avenue, Brooklyn, the dimensions being 200 x 130 feet. It will be a one story structure with a two story office. Sales Manager William Ladden states that the new factory will assist materially in increasing the firm's fabric tire production and will put them in a position to introduce a new cord tire in the spring.

McElrath Tire to Build

Several hundred stockholders of the McElrath Tire and Rubber Co. of Cleveland, at a recent meeting in Akron, heard officials of the company tell of the progress being made by the new concern.

The stockholders greeted with enthusiasm the announcement made by Mr. McElrath to the effect that the factory building will be started just as soon as the Erie railroad completes the placing of a railroad siding adjacent to the factory site. It was also stated that the company has purchased three and one-half acres of land bordering on the original property. The addition of this piece of land is said to round out the porperty into one of the most desirable tire factory locations in this part of the country.

It was also stated that all the machinery required for the company is ready for installation and that the company is unusually well protected in the way of fabric supplies.

Wishnick-Tumpeer Chemical Co. Formed

The Wishnick-Tumpeer Chemical Company is the name of a firm which has been recently organized under the State of Illinois on May 4. The charter was granted May 7. Capitalization of the new firm is $100,000, stock is all subscribed for and $50,000 is already paid in. The company will have its permanent headquarters, both warehouse and offices at the North Pier Terminal, at 365 East Illinois street, Chicago, Ill.

The company will specialize in rubber compounding ingredients and will carry stocks of standardized materials in Chicago for the convenience of mid-western and far-western rubber manufacturers. The company will also act as selling agents and will also manufacture a number of specialities.

The firm is under the active management of Robert I. Wishnick, who is president and treasurer. Mr. Wishnick is a graduate of the Armour Institute, chemical engineering course, and has had two years experience in this line. He was identified with Ketzenbach & Bullock Co. for one year and then joined A. Daigger & Co., of Chicago. He was with this firm for three years, first as chemical manager and later as vice-president. He resigned on April 26 to form the present company.

Julius Tumpeer, vice-president of the new firm, was formerly connected with A. Daigger & Co., covering the western and middle western territory for that firm. David Tumpeer, secretary, has also been associated with Mr. Wishnick for the past three years.

Ford With Rotary Tire

R. B. Ford, formerly connected with the B. F. Goodrich Co. as special representative and branch manager at Utica and Syracuse, N. Y., and Columbus, Ohio, has been appoined sales-manager of the Rotary Tire & Rubber Company with headquarters at Zanesville, Ohio.

Tires a Necessity Not a Luxury

(Special Akron Correspondence)

Rubber manufacturers in the Akron districts are taking sharp issue with those who class the automobile and its rubber tires as luxuries. This question has been brought to the fore again by the recent transportation tie-up and its resultant orders on priority classification of shipments by rail.

C. W. McLaughlin, vice-president of the Mohawk Rubber Company, voiced the opinion of Akron rubber manufacturers in a recent address before the Association of Reserve City Bankers in Cleveland. "I believe," he said, "that for every mile of pleasure driving today there are twenty-five miles of business driving.

"How many of you live in the suburbs of cities and ride to work on fifteen or twenty minutes who would spend an hour or more on a street car. Has the forty-five minutes saved for your business any value?

"The farmer who used to take all of Saturday in going to market now uses his machine or sends his wife with the produce for market and a return load of groceries. His time for work is increased many hours.

"This is an age of progress, and time is our most valuable asset. The auto and truck save time and energy. We have not scratched the surface in their business use. The railroads are broken down. One way to relieve this situation is to give the short haul to the truck.

"Let us build our roads better, so that the farmer can market his crops when work is slack. If we save farm labor's time by the use of trucks, we help fill our warehouses, and thus reduce the cost of living. Trucks do not eat gas and tires except when in use; horses must eat each day.

"Rubber is a necessity. Its production and manufacture must be fostered as essential to the world's progress."

Tracing the growth of the rubber industry from a small beginning to a volume of trade of $1,094,964,000 in the year just past, Mr. McLaughlin said: "You see we are getting close to the steel industry and hope to pass it in the near future."

It was pointed out that millions of dollars had been received for new stock in refinancing operations, while most of the earnings of rubber companies had been allowed to remain in the treasuries of the various companies for working capital. One company in Akron started with a capital of $150,000 common stock. This was increased to $2,000,000 by stock dividends from earnings during a period of years.

Mr. McLaughlin estimated that the 1920 production of automobile tires in the States should be 40,000,000, to equip 1,500,000 new cars and maintain 7,000,000 now in operation. This would take nearly 5 per cent of the world's cotton production, or 400,000 bales. The price of fabric has increased from 45 cents to $2.75 in three years.

The bankers were told that the United States now consumes 70 per cent of the world's rubber supply. The demands of American manufacturers have more than kept pace with the rapid increase in the world's production. It is estimated that American companies will use more than 345,000 tons of plantation rubber alone this year. Practically all of this will be produced in the Orient, where plantations occupy almost 3,000,000 acres. Experiments in the Philippine Islands have indicated that rubber growing possiblities there are great. Capital invested in the Orient is estimated at $300,000,000, chiefly British.

The speaker quoted a recent report from London, estimating the world's actual consumption of rubber during 1919 at 300,000 tons. An annual increase of 15 per cent would raise the demand to more than 600,000 tons in 1924. To meet this the plantation estates would have to yield an average of between 450 and 475 pounds an acre. In the last 10 years, consumption of rubber increased 27.7 per cent, Mr. McLaughlin said.

The speaker stressed the importance of Akron as the rubber center of the world. With its 24 factories employing 75,000 men and women, that city is turning out an annual product valued at $427,760,000. Boston is next with $70,000,000, he said, and Trenton third with $35,000,000.

Goodyear Employes Buy Stock

The title of "the company with the largest percentage of employe stockholders in the United States", will probably be conferred upon the Goodyear Tire & Rubber Company within the next few weeks following the present stock sale among its workers.

In the two previous sales 21,957 out of a total of 47,983 employes of both sexes subscribed for $11,858,400 worth of the company's preferred stock.

For the first time in the company's history, employes have been granted the privilege of purchasing common stock—previous sales having been confined to preferred. If the first sales report of $100,000 subscribed on the opening day is any indication, the total number of employe-stockholders will be greatly increased.

In previous sales, employes have been aided by a splendid plan by which the company aided workers to finance their stock purchases by means of monthly wage deductions. However, the present privilege of buying common stock is based on cash payments, but it is not anticipated that this provision will greatly affect the amount of stock that will be subscribed for.

Honor War Dead

With simple but impressive ceremony the bronze memorial tablet in the lobby of Goodyear hall, Goodyear Tire & Rubber Co., Akron, Ohio, was dedicated Memorial day in honor of the 105 Goodyear men who gave up their lives for America.

P. W. Litchfield, vice president and factory manager, made the dedicatory address, standing along side the tablet, while members of the American Legion, in uniform stood at attention before it and a soldier, a sailor and a marine mounted guard.

Akron Stock Prices

(Special Akron Correspondence)

The new Goodyear common stock, after issuance of the 150 per cent stock dividend, brought about 134 in first sales on the Akron exchange; and immediately showed a slight tendency to weaken as usually is the case following a stock melon.

One reason for weakness in Goodyear common is attributed to the policy of the directors in offering to the public the unsold portions of the $20,000,000 in preferred and $10,000,000 in common, recently authorized, on the same terms as the shares were offered stockholders and employes—two shares of preferred and one of common at par, $300.

Goodyear employes, it is said, took took $1,000,000 worth of stock in blocks of $300. No announcement has been made as to the amount taken by stockholders.

At the current prices when Goodyear stock was offered after the issuance of the stock dividend, a $300 block was a good buy. Preferred was bringing between 89 and 90 and common between 133 and 134. Even taking the low figures a block of three was selling at $311 on the market while the company was offering it at $300.

In offering the three-share blocks to the public, the brokers used company figures showing sales for the present fiscal year runing at the rate of $225,000,000.

Outside the new figures on Goodyear stock, quotations on the local exchange have changed little in the past two weeks. Goodrich common is still around 65 and Firestone common is around 155.

Following are the quotations of June 15th:

	Bid	Asked
Amer. R. & T. com.	82	88
Amazon Rubber	...	96
Firestone T. & R. com	152	156
do 6 per cent pfd.	90½	91½
do 7 per cent pfd.	92	92½
General T. & R. com.	800	900
do 7 per cent pfd.	...	98
B. F. Goodrich com.	63½	66
do 7 per cent pfd.	89½	90½
do 5 yr. 7 per cent notes.	94⅛	95⅛
Goodyear T. & R. com.	132	136
do 7 per cent pfd.	87	88
India Rubber com.	175	190
do 8 per cent pfd.	...	93
Mason T. & R. com.	24	27
do 7 per cent pfd.	...	70
Marathon com.	...	50
Miller Rubber com.	...	160
Mohawk Rubber	...	300
Portage Rubber com.	80	90
do 7 per cent pfd.	...	80
Republic Rubber Com.	2½	3
do 7 per cent pfd.	...	65
do 8 per cent pfd.	20	30
Rubber Products	...	110
Star Rubber com.	160	175
do 8 per cent pfd.	...	100
Swinehart com.	...	75
*do 7 per cent pfd.	...	80
Phoenix Rubber com.	...	22½
do pfd.	...	90
Standard Tire com.	175	185
do 7 per cent pfd.	...	90

Lee Sales Increase

Net sales of the Lee Rubber & Tire Corporation for the four months ended April 30, last exceeded $2,850,000, an increase of 60.5 per cent over the same period of 1919, and net earnings were more than $350,000, a gain of 50 per cent over the previous year. The sales of the company's puncture-proof tires almost doubled in the four months under review.

Rubber Imports for May

Figures compiled by the Rubber Association of America indicate that the rubber imports during the month of May were much greater than the importations into this country for the corresponding period last year. The general belief was that the improvement in sterling exchange was responsible in a large measure for the increased volume of shipments. A considerable quantity of these shipments has also been taken by dealers to cover contracts made some time ago. Following are the detailed figures of the Rubber Association:

PLANTATIONS

From—	Tons.
Liverpool	160
Rotterdam	736
London	4,875
Padang	116
Singapore	9,853
Medan	66
Colombo	3,163
Deli-Belawan	1,221
Batavia	1,056
Cochin	71
Sourabaya	962
Tandjong Priok	528
Penang	1,150
Pt. Swettenham	235
Kobe	13
Japan & others	218
Total	24,443

AFRICANS

From—	Tons.
Marseilles	251
Antwerp	115
Bordeaux	54
Havre	118
Liverpool	41
Lisbon	83
Total	662

CENTRALS AND GUAYULE

Centrals, Mexico & Central America	95
Guayule (Mexico) Eagle Pass by rail	113
Total	208

PARAS

From—	Tons.
Manaos	967
Talcahuario	3
Para	962
Ceara	29
Itacoatiara	13
Iquitos	51
Total	2,025

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

Waste	224
Balata	45
Miscellaneous Gums	1,059

COMPARISON 1919-20

	May, 1919.	May, 1920.	Total importations 5 months ending May 31, 1919.	1920.
Plantations	14,856	24,443	82,199	121,492
Paras	772	2,025	12,216	11,457
Africans	389	662	1,307	3,183
Central	97	95	666	523
Guayule	234	113	910	340
Manicoba and Matto Grosso	....	....	112	13
Total	16,348	27,338	97,410	137,008

ARRIVALS PLANTATIONS FOR MAY, 1920, SHOWING PORTS OF ORIGIN AND ARRIVAL

From and Arrived at—	Tons.
Singapore, New York	9,827
Singapore, San Francisco	26
Deli-Belawan, San Francisco	495
Deli-Belawan, New York	726
Kobe, San Francisco	13
Medan, New York	66
Penang, New York	774
Penang, San Francisco	376
Batavia, San Francisco	66
Batavia, New York	990
Sourabaya, San Francisco	52
Sourabaya, New York	910
Japan and others, New York	22
Japan and others, Vancouver	196
Pedang, New York	116
Tandjong Priok, New York	528
Colombo, New York	3,163
Cochin, Seattle	71
Rotterdam, New York	756
Liverpool, New York	160
London, New York	4,875
Port Swettenham, New York	235
	24,443

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports—		
New York		23,148
Pacific Ports—		
San Francisco	1,028	
Seattle	71	
Vancouver	196	
		1,295
		24,443

Vulcanization Method Discovered

A dispatch recently received from London under date of June 14 comments upon a recent discovery in the rubber field as follows:

"A rubber age is predicted as a consequence of a discovery made by a Manchester chemist. Working alone in his laboratory one night. S. J. Peachey, lecturer at Manchester College of Technology, discovered that it is possible to vulcanize rubber speedily and perfectly by means of two cheap gases—sulphur dioxide and hydrogen sulphide—at a mere fraction of the cost of existing processes.

"Astonishing claims are made as a result of this discovery. Rubber goods will be much cheaper, and among other results will be the production of boot soles lasting four times as long as leather ones, felt hats that will be very much cheaper than those now made, and a floor covering of rubber and sawdust at a price considerably under the present cost.

"Some rubber experts describe Peachey's discovery as "truly revolutionary." Others advise not to expect too much immediately."

New Rubber Products Representative

C. H. Connelly has assumed the duties of Southwestern manager of the Rubber Products Company, manufacturers of Stronghold tires and tubes, with headquarters at Kansas City.

Mr. Connelly's office will control all that section of territory from Nebraska to the Gulf and from St. Louis to Denver.

Geo. B. Kretsinger will assume the duties of office manager of the Kansas City Branch on July 1st.

Muller Purchases New Factory

The Muller Tire & Rubber Co., Inc., of New York, was recently organized to take over the Muller Sales Corporation and the Nu-Tread Tire & Rubber Co. The officers elected were William H. Muller, Jr., president and general manager; H. K. Knapp, Jr., vice-president, and A. F. Tompkins, secretary and treasurer. Executive offices and show rooms are at 1844 Broadway, New York, while the factory is at 141st street and Park avenue.

In taking over the Nu-Tread Tire & Rubber Co., the Muller Tire & Rubber Co. has acquired the largest daylight plant making rebuilt tires exclusively in New York City. President and General Manager William H. Muller, Jr., states that the consolidation was brought about due to the necessity of having one centralized control over the ever-increasing businesses.

New Plant for California

A tire factory to cost approximately $2,000,000 is to be built at San Pedro, Cal. Within a few days the ground will be broken and the first unit of the new plant will be under construction.

This announcement was made by H. O. Averill of the firm of Averill-Weymouth, following a conference with J. H. Christian president of the Fabri-Cord Tire Company of California.

The first unit of the structure will consist of a three-story building covering an area 60x250 feet. It will be of solid reinforced concrete construction combining every modern feature, which will add to the efficiency of productions.

The initial investment will be $460,000. Of this amount the land represents $180,000, the building $80,000 and the equipment $200,000.

The company will engage in the manufacture of cord tires and inner tubes. From 400 to 600 men will be employed. The output from the first unit will be 500 tires and 1500 inner tubes daily. The total working force when the plant is complete will be from 1500 to 1700 men.

J. H. Christian, president and general manager of the new company, is well-known in the tire industry of America. He founded the Perfection Tire Company, a $15,000,000 concern, and carried that enterprise to nation-wide repute. Associated with Mr. Christian in the promotion of thhe Fabri-Cord Company are Dr. Ross More of Los Angeles, vice president; E. L. Ide, secretary of the Wholesale Credit Men's Association, treasurer; S. H. Christian, secretary. Directors named thus far are Harry McLean, Los Angeles attorney, and Joseph Lathrop, Chicago capitalist. The directors will include prominent Los Angeles and San Pedro business men.

Rockwood Returns from Far East

C. D. Rockwood, purchasing agent of the Mason Tire and Rubber Company, of Kent, Ohio, has returned from the far east, where, in connection with J. P. Mathews, the resident manager of the Mason Rubber Plantations Company at Singapore, negotiations looking to the acquirement of extensive rubber plantations for the company were undertaken. The completion of this project with the supply of cotton fabric and cord by the Mason Cotton Fabrics Mills at Kent, Ohio, which are now in operation, will place the tire division of the Mason Tire & Rubber Company in control of two great essentials of tire production. The extensions of the tire plant are practically completed and the installation of the necessary additional machinery is going forward.

Miller School a Sucesss

Four hundred men have graduated from the Miller Tire Repair School during its ten month of service. Each man received a diploma certifying to his skill, as a tire surgeon, in repairing not only millers but every standard make. The four weeks course includes twenty lectures on shop management, shop plans and sales methods besides practical repair work.

Tire Production Curtailed

The following article commenting upon conditions in the rubber industry appeared in the June 11th issue of Financial America:

The automobile tire factories of this country which planned a record production for 1920 amounting in money value to $1,000,000,000 have been compelled to curtail their operations with the result that deliveries will be considerably behind the dates originally determined upon. This assertion was made by dealers in crude rubber who pointed out there had been a downward trend of prices in the market for the product following the cessation in orders from tire factories and the unloading in this country of large quantities of the yield stored in warehouses in India during the world war.

One of the chief causes of the lack of production in the tire factories in Akron, Ohio, has been the necessity for utilizing thirty per cent of the space in the plants or housing output that is being held pending the untangling of the freight transportation tieup. This drawback and the difficulty of obtaining cotton fabric for the tires has cut down production of the factories fifty per cent, it is estimated.

The inability to obtain the cotton fabric is attributed in a measure to failure to readjust all of the spindles which were altered for war purposes and lack of efficient workers. Then, too, there has been a marked increase in the demand for Egyptian cotton which is used in tire fabrics, while there has been a five-year decrease in the crop totaling approximately about 1,750,000 bales of 500 lbs. each. These conditions resulted in marked advances and wide fluctuations in the market. It is impossible to estimate the average prices for the growing Egyptian crop, according to authorities on the subject.

They assert that Egyptian crops during the last five years have averaged only slightly more that 1,100,000 bales of 500 lbs., compared with an average for the previous five years of 1,350,000 bales. Shipments to the United States during the season of 1918-19 totaled 82,500 bales, while in 1917-18 season, 113,961 bales were sent here.

Manufacturers of automobile tires had planned a production totaling 40,000,000. It is said that deliveries of about half that number of tires already have been made. Conditions now prevailing at the factories, according to a representative of a crude rubber dealer who recently returned from Akron, make it problematical as to when the balance of the deliveries will be made.

The tire factories absorb most of the crude rubber shipped to this country, but the managers of the plants are far more concerned regarding the fabric and the freight situations than any other phase of the production angle, it is said. There are large quantities of crude rubber in this country,most of it delayed in shipment by the war. A standard quality is now quoted at approximately 38c a pound, compared with 59c. in October, 1918, and 53½c. in January of this year.

The manufacturers of rubber shoes, boots and overshoes also provide markets for crude rubber. There is a steady demand for the output of the plants manufacturing these articles.

Mason Issues Statement

The Mason Tire & Rubber Co., of Kent, Ohio, has recently issued a financial statement as of April 30, 1920, reflecting the absorbtion of the Mason Cotton Fabrics Company; also, a certifield operating report for the first six months of the firm's fiscal year ending April 30.

Sales for the first six months amount to as much as those for the preceeding twelve months and net profits for the six months amounting to $689,000 are three times greater than for the entire preceeding twelve months. The earnings of the newly acquired Textile Division are expected to show more heavily when the division has been in operation for a longer period. Serial gold notes shown in the liabilities in the financial statement are one to six year corporation notes—they are neither bond nor mortgage notes. The balance sheet follows:

Globe Tire Announces Dividened

J. B. Linerd, president of the Globe Rubber Tire Manufacturing Company, at teh recent directors' regular monthly meeting announced a stock dividend of ten per cent payable July 1 to stockholders of record of June 30.

This is the second ten per cent stock dividend this year. With the two regular quarterly cash dividends of one and one-half per cent each already paid, it brings the dividend for the half year to twenty-three per cent.

The business of the company for the first five months of the calendar year, and for the first eight months of the sales year, is approximately sixty per cent over that of the corresponding periods last year. This is principally due company officials assert, to the production of the over-sized cord tire brought out two years ago by the Globe Rubber Tire Manufacturing Company.

It has created a demand in excess of early expectations, and, as a result, production is engaged for some months ahead.

ASSETS			
Cash Balances		$803,919 58	
Accounts and Notes Receivable, Mdse.	$998,776 56		
Less Reserves	50,739 94	948,036 62	
CURRENT:			
Accounts Receivable, Stock		85,112 00	$1,837,068 20
Inventories:			
Finished Goods at Factory and Branches		$1,065,499 11	
Work in Process		109,773 84	
Raw Material and Supplies		1,070,381 07	2,245,654 02
Miscellaneous Investments			104,500 00
FIXED:			
Real Estate, Buildings, Etc.		$1,193,941 35	
Machinery and Equipment		1,253,466 67	
Total		$2,447,408 02	
Less Reserves for Depreciation		92,339 60	2,355,068 52
DEFERRED CHARGES:			
Miscellaneous			133,826 59
Good Will, Trade Marks, Etc.		$2,169,121 84	
Less Capital Surplus		840,463 75	1,328,658 09
			$8,004,775 42
LIABILITIES AND CAPITAL			
CURRENT:			
Accounts and Bills Payable		$405,228 17	
Accrued Taxes and Expenses		50,098 64	$455,326 81
7 per cent Serial Gold Notes			750,000 00
RESERVES:			
For Income Taxes		$19,651 30	
For Tire Adjustments		76,193 11	
Miscellaneous		22,924 78	118,769 19
CAPITAL:			
7 per cent Preferred Stock		$5,185,620 00	
Common Stock "A"		500,000 00	
Common Stock "B"		343,521 25	6,029,141 25
SURPLUS:			
Auditor's Balance Nov. 1, 1919		$ 45,671 51	
Income Tax and other adjustments		32,581 57	
Profits for half year		689,479 02	
Total		$767,732 10	
Less Dividends	$102,481 11		
Less Adjustments	13,712 82	116,193 93	651,538 17
			$8,004,775 42

Contingent Liability on Trade Acceptances discounted $1,254,713.85

PROFIT AND LOSS STATEMENT
Six Months Ending April 30, 1920

Gross Sales for period		$3,454,586.89
Less Discounts, Returns and Corrections		425,121.08
Net Sales		$3,029,465.81
Less Cost of Goods Sold		2,013,350.35
Gross Profit		$1,016,115.46
Less Selling and Administrative Expense		554,567.08
Tire Division, Net Profit		$ 461,548.38
Textile Division, Profit, Material Sales		227,930.64
Total net profits for six months		$ 689,479.02

MARKETS

Manufactured Rubber Goods

NEW YORK, JUNE 21, 1920

The general situation remains unchanged. Car shortage is growing more alarming as the harvest and the fruit shipping seasons approach, and many cars are being diverted from the carrying of general freight to the movement of perishable foodstuffs. The markets for raw materials used in the manufacture of rubber goods are hanging fire. The upward trend of prices has been stopped in practically every line save tire fabrics, and in some lines the price recession has set in. Manufacturers are keeping production up to schedule whenever possible, but some of the makers are being forced to slow down operations due to shortage of raw materials, or because of a glut of finished products which cannot be shipped.

EXPORTS

No general improvement is to be noted in the export situation, and buying for foreign account is still limited to small lots. There is some demand for American rubber surgical goods abroad, but other products are not selling in a large way, even when needed in foreign countries, as prospective purchasers are unable to arrange sufficient credits.

AUTOMOBILE TIRES

Producers of leading makes of tires are holding the market firm at list prices. There is a good demand reported, but distribution is being restricted owing to poor transportation facilities. Production is also being cut down in some lines, and manufacturers are warning consumers to stock up with tires, especially Ford sizes while they have the opportunity of getting what they want. Later on, the manufacturers point out, this opportunity may not be available.

As far as can be ascertained from tire dealers, the high prices charged for gasoline and oils has not resulted in any material curtailment of motoring, and dealers report that the demand for tires is strong.

BOOTS AND SHOES

Summer weather has brought out an active demand for canvas topped rubber soled shoes, and wholesalers report a large sale of these goods. The rubber soled shoes have been brought into prominence as economical and comfortable summer footgear by several years of constructive and nation-wide advertising on the part of leading manufacturers.

Fiber and rubber soles are meeting with a better demand and sales have increased considerably during the past few weeks. Rubber heels are also selling well and many of the larger manufacturers are being taxed to capacity to keep their deliveries up to the requirements of their trade. Export buyers are showing interest in offerings of both heels and soles made of rubber or composition goods but buying is held up by the unfavorable rates of exchange.

MECHANICAL GOODS

Buying of belting is reported to be quiet along routine lines, but a steady demand for packing is reported. Manufacturers of mechanicals expect to come in for a big volume of railroad business within a few months, as the roads are beginning to repair their present equipment and are placing orders with manufacturers for additional freight and passenger cars, all of which will require rubber goods.

MISCELLANEOUS

There is a fair demand reported for rubber toys and novelties and new lines are being constantly developed by manufacturers. Bathing caps are selling well, but this business is virtually over insofar as the manufacturers are concerned, the goods having been turned into the hands of the wholesalers some time ago. The manufacturers are prepared to take on only a limited amount of replacement business at the present time. With the home preserving season getting under way, more inquiries for rubber jar rings are reaching manufacturers, but the volume of business is not nearly up to normal, due mainly to the shortage of sugar.

Cottons, Yarns and Fabrics

NEW YORK, JUNE 20, 1920

The price trend in the cotton market has been downward during the month, prices being off on cotton for early shipment. The bullish Government report early in the month was expected to stimulate trading and bring on higher prices, but no such action followed its issuance. Domestic users of cotton are not buying in large quantities at the present time as they are unable to market finished cotton goods under present conditions, but buying must be resumed sooner or later and higher prices appear to be inevitable, when the new crop is put on the market. Another factor in the decline in the market is the lack of export buying at the present time.

Southern spot markets, however, are not showing any anxiety to follow the downward trend of the market, even though it be granted that present declines are only temporary and will be made up later on in the season. Holders of good quality cotton are still keeping it and are demanding their own prices which are frequently altogether out of line with exchange prices. Holders of low grade cotton are not so bullish in their sentiment, however. Most of the remaining stocks are said to be of low grade and holders of the inferior grades, particularly cotton grading below middling, are increasing their discounts in an effort to clear their accumulated holdings.

EGYPTIAN COTTON

Boston importers are holding the market for Egyptian cotton on the basis of 91 cents per pound for fully-good-fair grade of uppers, while good staple is held at 92 to 93 cents per pound. Trading is reported as quiet. Advices from Egypt regarding the new crop outlook are extremely variable. There is a persistent report that the Government authorities will limit the acreage this year to one-third that of last year in order to permit of the growing of more foodstuffs but this report would seem to be discredited by early reports from various growing sections in Egypt which tend to show that the output will be increased this year.

SEA ISLAND COTTON

There is a continued strong market ruling for Sea Island cotton, latest reports from Southern spot markets quoting No. 2 Sea Island cotton, or extra choice with average staple, on the basis of $1.15 per pound, f. o. b. Savannah. There is a fair inquiry reported. Nothing further regarding the new crop is to be noted and growers are looking only for a small yield.

ARIZONA-EGYPTIAN COTTON

Weather conditions in the Southwest are generally favorable, according to the Department of Agriculture, and growers of the Arizona-Egyptian cotton are looking for a bumper crop this season. Spinners of tire fabrics have contracted for the bulk of the 1920 crop, it is reported. Expected curtailment of Egyptian cotton acreage is lending strength to the future market for Arizona cotton as demand would be greatly strengthened by any cut in production of the Egyptian staple.

DRILLS, SHEETINGS AND OSNABURGS

There is a growing disparity between prices quoted on the spot market, and those in force at the mills. Manufacturers have advanced their prices on several lines of cotton goods, while second hand holders have lowered their prices. The latter, however, are more disposed to effect a quick clearance of their spot holdings as they are prompted both by the necessity for funds and by lack of faith in the stability of present prices. Some reductions in prices charged for sheetings in the local market have been affected, while drills are also tending lower on spot offerings.

TIRE FABRICS

The market has not yet been affected to any appreciable extent by the declines common in other fabric markets, as a good part of present production is going direct to tire manufacturers on contracts, these deliveries being made at the prices specified in the contracts. Tire fabrics have not been offered in a spot way for months past.

HOSE AND BELTING FABRICS

The market is holding generally steady on the spot position, and there is a fair demand reported by local sellers. Single filling ducks are to be had down to 36 cents per yard in some quarters, while many sellers quote up to 40 cents per yard. Double filling ducks are strong at 40 cents per yard. Enameling ducks hold steady at 95 cents per pound, with freight added, prices being higher for goods of special widths. Shoe ducks offering only in second hands, and held at 90 cents per pound. Hose and belting ducks steady at 80 @ 82 cents per pound.

TIRE FABRICS

17½-ounce Sea Island, combed, sq. yd.	Nominal	
17½-ounce Egyptian, combed	2.35	@ 2.50
17½-ounce Egyptian, carded	2.25	@ 2.40
17¼-ounce Peelers, carded	Nominal	
17¼-ounce Peelers, combed	2.25	@ 2.35

DUCKS

Belting (pound basis) ..... lb.	.78½	@	.82
Hose (pound basis)	.78½	@	.82
Enameling	.88	@	—
Shoe Ducks	.90	@	.92
Single filing ..... yd.	.35	@	.38
Double filing	.38½	@	.40

DRILLS

37-inch 2.35-yard ..... yd.	.32	@	—
37-inch 2.75-yard	.27½	@	.28
37-inch 3.00-yard	.26	@	—
37-inch 3.25-yard	.25½	@	—
37-inch 3.50-yard	.25½	@	—
37-inch 3.95-yard	.20	@	—
37-inch 2.00-yard Southern	Nominal		
37-inch 2.00-yard Northern	Nominal		
40-inch 2.40-yard Southern	Nominal		
40-inch 2.40-yard Northern	Nominal		
52-inch 1.90-yard Southern	Nominal		
52-inch 1.90-yard Northern	Nominal		

SHEETINGS

40-inch 2.35-yard ..... yd.	—	@	—
40-inch 2.50 yard	.30½	@	—
40-inch 2.85-yard	.29	@	—
40-inch 3.00-yard	—	@	—
40-inch 3.25-yard	—	@	—
40-inch 3.75-yard	.26	@	—
40-inch 3.60-yard	.28	@	.29
40-inch 4.25-yard	.22½	@	—

Note—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS
(Carload Lots)

	Cents	Per Yard
7 -ounce 40-inch	—	@ —
7½-ounce 40-inch	9.90	@ —
7½-ounce 45-inch	—	@ —
8 -ounce 40-inch	8.15	@ —
8½-ounce 40-inch	10.75	@ —
10 -ounce 36-inch	10.75	@ —
10 -ounce 40-inch	10.75	@ —
10 -ounce 45-inch	Nominal	
10½-ounce 40-inch	11.00	@ —

Chemicals and Compounding Materials

NEW YORK, JUNE 22, 1920.

With the resumption of the outlaw strike on the railroads, the freight situation is becoming worse than ever, and shippers have to undergo almost insurmountable obstacles to get shipments other than food products through. It is hoped that the War Labor Board will render a prompt decision on the railway workers' demands and allow them to get their minds back on running trains again.

The market for chemicals and compounding materials has not resumed its advance, and it is believed that the peak of prices has been passed on most articles, although isolated cases of price advances are to be noted from time to time, these being mainly the result of some sudden shortage. Imports of materials are getting under way on a larger scale, and some relief from the shortage of domestic chemicals and compounding imports is thus being obtained. The volume of imports, however, is not yet large enough to allow the imported materials to become any deciding factor in the domestic market.

EXPORTS

Buying for shipment abroad continues generally quiet, due both to the shortage on the domestic markets and the foreign exchange situation. Most of the export trade at present is with South and Central American countries, which can buy American chemicals without facing the drawback of an overwhelmingly unfavorable exchange rate.

BENZOL

Producers of benzol are still behind in their contract deliveries, and there are no offerings heard of on spot, save the small offerings of second hands. The market is being firmly maintained on the basis of 28 cents per gallon for 90 per cent, with the pure commanding 30 cents per gallon. Manufacturers are bending every effort to catch up with their business, and are reported to be making some success in their efforts to bring their production up to a point equalling demand.

LITHARGE

Stocks of litharge are not large, and producers are not in the position where they are looking for any additional business, being unable to take care of all their orders under present conditions. Consumers are having much difficulty in getting deliveries from producing points. The market is firmly maintained on the basis og 11¾ @ 12¼ cents per pound for American powdered in casks.

WHITING

Imports are showing some increases, but supplies are not yet large enough to permit of any lowering of quotations. Commercial whiting is strongly maintained at $1.40, with gilders' bolted held at $1.45, English cliffstone at $2.00, and American paris white at $1.75 per cwt. There is a steady demand reported.

LITHOPONE

There is a strong market for Lithopone, and prices are firmly held at 8 to 8¼ cents per pound. Producers are not looking for any additional business, and are having all they can do to take care of the present volume of business on their books. It is understood that the producers are planning expansion that will permit of their supplying the full requirements of consumers within the next fe wyears. There are some receipts of imported lithopone reported, coming from Germany by way of Antwerp.

BARYTES

Prices continue withdrawn, but producers are still accepting business on the basis of prices ruling at date of shipment. The producers guarantee, however, that this price will not be over $25 per ton. It is understood that the prevailing price is about $23.50 per ton, against $21.50, the quoted market a few weeks ago.

INTERMEDIATES

Spot aniline oil is firmly held at 35 cents per pound, but forward deliveries are held at about 33 cents. Benzidine is quoted higher in most quarters of the market, due to improvement in the demand, and spot holders are keeping the market firm at $1.35 per pound for the base, and $1.20 for sulphate. Beta napthol is nominally held at 85 cents, although a firm bid could beat this price. Dimethylaniline is quoted at $1.50 for spot, with the market quite. Nitrobenzol is firm at 14½ cents per pound in carlot quantities. Paranitraniline on spot is steady at about $1.60 to $1.65 per pound. Paraphenylenediamine is strong and firmly maintained on the basis $2.70 per pound.

MISCELLANEOUS

The high market for turpentine has been broken and supplies are now offering on the spot position on the basis of $1.80 per gallon. Supplies are not large, however, and the trucking strike on the Coastwise steamship piers is hampering the movement of current receipts.

Dry colors are showing a strong undertone, with prices nominal on many lines.

Zinc oxide is strongly held on the basis of quoted prices, and producers are unable to take care of all the business offered.

There is a better market for casein, and prices are steady at 15 to 18 cents.

Glues are firmly maintained at recent advanced prices, and there is a fair demand reported, although producers are having some difficulty in taking care of all the business offered due mainly to shipping difficulties.

Current Prices for Chemicals, Fillers, Colors, etc.

Acetone, carlots ..... lb.	.21	@	.22
smaller lots ..... lb.	.22	@	.23
Acetanilid, C. P., bbls. . lb.	.70	@	.80
Acids, Acetic, 56 per ct. cwt.	8.40	@	9.15
Carbolic, C. P. ..... lb.	.12	@	.20
Muriatic, 20 deg. . . . cwt.	2.25	@	2.50
Muriatic, 22 deg. . . . cwt.	3.00	@	3.25
Nitric, 42 deg. . . . . cwt.	7.50	@	8.00
Nitric, 40 deg. . . . . cwt.	7.00	@	7.25
Sulphuric, 60 deg. car lots ..... tons	19.00	@	21.00
Sulphuric, 60 deg. car boys	19.00	@	21.00
Tartaric, crystals . . . lb.	.76½	@	.77
Aluminum, Silicate	Nominal		

Aniline oil, bulk basis, Contract	—	@	—
Imported	Nominal		
Domestic	.33	@	.35
Antimony—			
Oxide ..lb.	.13½	@	.14
Sulphuret, red ..lb.	.19	@	.20
Sulphuret, golden ..lb.	.20	@	.22
Sulphuret, crimson..lb.	.45	@	.50
Alcohol, denatured, 190 proof	1.08	@	1.12
Wood, 95 per cent.	3.25	@	3.30
Ethyl, 190 proof	Nominal		
Aldehyde Ammonia	Nominal		
Ammonia, powdered	.17	@	.17½
Ammonium Carbonate, domestic ..lb.	.16	@	.16½
Amyl Acetate ..gal.	4.70	@	4.80
Anthracene, 80 per cent.	1.00	@	1.10
Anthroquinine, 95 per ct.	4.00	@	4.25
Asbestine	Nominal		
Asphaltum, Egyptian ..lb.	.30	@	—
Domestic ..ton	.30	@	.40
Barium, dust	—	@	—
Sulphide ..lb.	.07¼	@	.07½
Barytes, prime white imported ..ton	Nominal		
white, domestic ..ton	Nominal		
off-color, domestic ..lb.	Not quoted		
Southern, f.o.b. mills.	21.50	@	25.00
Western, f.o.b. mills.	23.50	@	25.00
Beeswax	.28	@	.65
Benzidine Base ..lb.	1.35	@	1.40
Benzol, 90 per ct..gal.	.28	@	.30
Benzol, pure bulk, 100	.30	@	.35
Blanc Fixe, dry, bbls..lb.	.05½	@	—
Benzidine, 90 per ct..gal.	1.35	@	1.40
Burgundy Pitch, dom..lb.	.08	@	.10
Foreign	.60	@	.65
Blacks, Drop ..lb.	.05½	@	.15
Ivory	.16	@	.30
Carbon, gas, cases..lb.	.15	@	.30
Lampblack R M..lb.	.15	@	.45
Mineral blacks ..ton	35.00	@	45.00
Blues, Prussian	1.00	@	—
Soluble ..lb.	1.00	@	—
Ultramarine ..lb.	.15	@	.50
Browns,			
Umber, Turkey, burnt powdered ..lb.	.05½	@	.07
American, burnt ..lb.	.04½	@	.06
Cadmium, sulphide, yellow lb.	1.75	@	2.00
Carbon Disulphide, bulk..lb.	—	@	—
Bisulphide ..lb.	.07½	@	.08
Casein, C. P..lb.	.35	@	.36
Castor Oil	.19	@	.22
Caustic Soda, 76 per ct.cwt.	6.50	@	6.75
Chalk, precipitated, extra light ..lb.	.05½	@	.06
heavy ..lb.	.04½	@	.05
China clay, domestic..ton	9.00	@	20.00
imported ..ton	19.00	@	24.00
China Wood Oil, bbls..lb.	.22	@	—
F.o.b. Pacific Coast..	.18½	@	—
Chloroform, U. S. P.	.40	@	.45
Coal Tar Pitch	—	@	—
Cottonseed Oil, crude f.o.b. mills ..lb.	15.25	@	15.50
Prime summer yellow ..bbls.	18.50	@	—
Dimethylaniline ..lb.	1.85	@	1.90
Elateron	—	@	—
Formaldehyde, spot ..lb.	.55	@	.57
Fullers Earth, powd., 100 lbs.	1.50	@	2.00
Fossil flour ..lb.	.03¾	@	.05
Genasco Mineral Rubber.	—	@	—
Gilsonite ..ton	55.00	@	—
Glue, extra white ..lb.	.35	@	.45
medium ..lb.	.30	@	.35
low grade	.20	@	.25
foot stock	.17	@	.21
brown foots	.17	@	.21
common bone	.16	@	.20
Glycerine, C. P. (drums)lb.	.28	@	.28½
cans	.29	@	.30
Graphite, flake (bbl.)..lb.	.14	@	.20
powdered (bbl.) ..lb.	.05	@	.10
Green, chrome, R. M..lb.	.42	@	.71
Ground glass (fine) ..lb.	.03½	@	.04
Hexamethylene ..lb.	Nominal		
Infusorial earth, powd'd..lb.	.02	@	.035
bolted ..lb.	.035	@	—
Iron oxide, red, reduced grades ..lb.	.13	@	.15
red, pure, bright..lb.	—	@	—
Hexamethyenetetramine.lb.	Nominal		
Kaolin	—	@	—
Lime, hydrated	—	@	—
Lead, red, dry (casks)..lb.	.12¼	@	.12½
sublimed ..lb.	—	@	—
white, basic carb..lb.	.10½	@	.11
white, basic sulp..lb.	.10	@	.10¼
Lime flour ..lb.	.01¾	@	.02
Litharge (casks) ..lb.	.11¾	@	.12¼
English ..lb.	—	@	—
Lithopone, domestic, bbls..lbs	.08	@	.08¼
in bags ..lb.	.07¾	@	—
M. R. X.	—	@	—
Magnesia, carbonate ..lb.	.17	@	.21
calcined light ..lb.	.60	@	.65
Magnesite, calcined, pwd.ton	50.00	@	65.00
Magnesia Oxide, heavy	—	@	—
Light	—	@	—
Extra light	—	@	—
Napthalene ..lb.	.15	@	.17
Nirobenzol	.14½	@	.16
Naphtha, motor gasoline, (steel bbls.) ..gal.	.28½	@	—
68 @ 70 degrees (steel bbls.) ..gal.	.35½	@	—
70 @ 72 degrees (steel bbls.) ..gal.	.36½	@	—
73 @ 76 degrees (steel bbls.) ..gal.	.38½	@	—
machine(steel bbls.)gal.	.47½	@	—
Oil corn, crude factory.cwt.	16.81	@	—
corn, ref. bbls.)..cwt.	20.56	@	—
linseed, (bbls.)	1.70	@	—
In carloads, spot	1.67	@	—
tank cars	1.60	@	—
Oil palm, Lagos ..lb.	.11¼	@	—
Niger	.10¼	@	—
pine, yellow ..gal.	1.00	@	—
distilled ..gal.	1.25	@	1.35
rapeseed, refined ..gal.	1.68¾	@	—
rapeseed ,blown..gal.	1.64	@	—
rosin first rectified.gal.	.85	@	—
second run	.88	@	—
tar (commercial) ..gal.	.38	@	.40
Oleum Acid, 20 per ct..ton	29.00	@	35.00
Orange mineral, Amer..lb.	.15½	@	.16½
imported ..lb.	Nominal		
Ozokerite	.35	@	.36
Paraphenylenediamine ..lb.	2.70	@	2.85
Petrolatum, bbls., amber.lb.	.06	@	.07
pale yellow ..lb.	.06½	@	.07
Paranitrosodimethylanaline .	3.50	@	4.00
Parafin, refined, 118 @ 120 m. p.	.12	@	—
127 @ 129 m. p.	.11	@	—
137 @ 140 m. p.	.12½	@	—
Phenol	.12	@	.25
Pumis	.05	@	.10
Pine tar kiln ..bbl.	14.50	@	—
Pitch ..bbl.	8.50	@	—
Plaster of paris ..bbl.	4.25	@	5.00
Red Tuscan ..lb.	.22	@	.30
red (American) ..lb.	.14	@	.16
Indian (English) ..lb.	.14	@	.16
Standard ..lb.	—	@	—
Rosin (common to good)— 280 lbs.	18.00	@	—
Rotten stone, powdered..lb.	.02½	@	.04½
Rubber, substitute, black..lb.	.13	@	.17
white ..lb.	.15	@	.24
brown ..lb.	.20	@	.25
Rosin Oil, first rectified.	.85	@	—
Second rectified	.88	@	—
Third rectified	1.06	@	—
Fourth rectified	1.10	@	—
Soda ash, light, 58 pct.cwt.	3.60	@	3.75
Sodium Nitrite ..lb.	.24	@	—
Solvent Naptha, crude, hvy.	.25	@	.32
Soya Bean Oil, bbls..lb.	.17	@	—
Sellers, tanks, f. o. b. Coast	.12	@	—
Stearic Acid, single	.24½	@	—
Shellac, fine orange ..lb.	Nominal		
Sulphur Chloride, drums.	.06½	@	.16
T. N. ..lb.	1.10	@	1.15
Bleached ordinary..lb.	1.05	@	1.10
Bleached, bonedry..lb.	1.20	@	1.30
Silex (silicia) ..ton	25.00	@	40.00
Soapstone, powdered ..ton	15.00	@	20.00
Starch, corn, powd..cwt.	5.62	@	—
pearl	5.47	@	—
Jap potato, duty pd, lb.	.05	@	.05½
Sulphur, crude ..ton	—	@	—
100 pounds	—	@	—
roll	3.20	@	—
commercial superfine.	2.00	@	2.25
Talc, American ..ton	30.00	@	40.00
French ..ton	50.00	@	—
Thiocarbanilid	—	@	—
Toluol, pure, in drums.gal.	.31	@	.35
commercial	.30	@	.32
Tripolite earth ..lb.	.01½	@	—
Turpentine, pure gum— spirit ..gal.	1.80	@	—
wood ..gal.	—	@	—
Venice, artificial ..gal.	.15	@	.16
true	Nominal		
Vermilion, English ..lb.	1.70	@	1.75
American	.25	@	.30
Vorite	Nominal		
Wax, beeswax, crude yel.lb.	.27	@	.29
refined	.34	@	.36
Bayberry	.37	@	.39
ceresin, white ..lb.	.15	@	.16
yellow	.14	@	.15
Whiting, commercial ..cwt.	1.40	@	—
Gilders Bolted	1.45	@	—
Paris white, Amer..cwt.	1.75	@	—
English cliffstone..cwt.	2.00	@	—
Xylol (gal.) pure	.40	@	.45
Commercial	.33	@	.37
Zinc Oxide, French process, red seal	.11½	@	.11¾
green seal	.12½	@	.12¾
white seal	.13½	@	.13¾
Leaded Grades—			
Commercial, lead free.	.09½	@	.10
5 per ct. lead sulphate.	.09	@	.09¼
10 per ct. lead sulphate	.08¾	@	.09¼
20 per ct. lead sulphate	.08½	@	.09
35 per ct. lead sulphate	.08¼	@	.09½
Zinc sulphate	.03½	@	.04¼

Crude Rubber

NEW YORK, JUNE 22, 1920

Manufacturers are not buying. There is an undercurrent of weakness to be noted in all quarters of the spot market, and prices are still apparently tending downward. Manufacturers have been out of the market for a considerable period now, and importers are looking for some early business as they believe that at least some of the manufacturers are pretty near the end of their supplies and will have to do some replacement buying.

Rubber for forward delivery is noticeably stronger than supplies now offering on spot, importers quoting the market for future delivery rubber at two or three cents per pound above the spot prices, on an average. Holders of crude at primary markets are showing no inclination to cut their prices in conformity with the downward trend, so the domestic trade may look for higher prices when the importers begin to get the new, and higher priced shipments of rubber.

Cents per Pound.			
Para—Up-river fine	.37	@	.38
Up-river medium	.34	@	.34¼
Up-river coarse	.28	@	28½
Caucho ball	29½	@	30
Islands fine	.39	@	39½
Islands coarse	.21½	@	—
Cameta	.21½	@	.22
Ceylon—Smoked sheets ,ribbed.	.38	@	.39
Smoked sheets, plain	.36	@	.37
Maderia, fine	.44	@	—
Knapsack	—	@	—
First latex pale crepe	.38½	@	39½
Amber crepe	.36	@	.39
Clean brown crepe	—	@	—
Rio Nunez string	—	@	—
Palembang	.13	@	.13½
African	—	@	—
Prime Surinam sheets	.84	@	—
Centrals—Corinto prime	.27	@	.28
Esmeralda, prime	.26	@	27½
*Balata, sheets	—	@	—
Guayule, wet	.28	@	—
Balata, block, Panama	.45	@	—

*Nominal.

Scrap Rubber

NEW YORK, JUNE 21, 1920

The scrap rubber market is inclined to easiness, and prices are nominally held throughout the trade. The freight tie-up is playing a big part in the situation, while the easy position of the market for crude stock is also tending to weaken the scrap market. There are heavy accumulations of many varieties of scrap rubber on the spot, and dealers are trying to move these supplies to reclaimers, but the latter apparently are not interested in present offerings.

Price cutting has been reported in some quarters where holders of heavy accumulations have been endeavoring to unload, but under present market conditions, price cutting is difficult to define, as there is in reality no established basis of quotations. Dealers are anticipating a better demand, and consequently a stronger market, in the fall, when reclaimers usually enter the market for stocks.

Cents per Pound.			
Boots and shoes	7.00	@	7.75
Arctics, trimmed	6.00	@	6.25
Arctics, untrimmed	5.00	@	....
Tires—Automobile	3.25	@	3.50
Bicycles, pneumatic	2.00	@	2.50
Mixed hose	1.37½	@	1.62½
Air brake	...	@	....
Inner tubes, No. 1	14.00	@	17.00
Inner tubes, No. 2	8.00	@	9.00
Red tubes	7.75	@	8.25

Cotton Conditions in the South and West

Department of Agriculture Issues Statistics on Cotton Crop—Percentage Condition Declines—Low Temperatures and Excessive Rainfall Responsible for Lateness of Start

The Department of Agriculture, in a report issued recently, places the condition of the cotton crop as of May 25 last at 62.4 per cent of a normal, as compared with 75.6 on May 25, 1919; 82.3 on May 25, 1918; 69.5 on May 25, 1917, and 78.7 the average of the past ten years on May 25.

The revised figures on the area planted in cultivation at the end of June, 1919, are 35,133,000 acres. The area picked in 1919 was 35,566,000 acres. The yield per acre in 1919 was 161.5 lbs. lint.

The condition of the crop on May 25 is stated by the Department of Agriculture to be the lowest mark in its record of fifty years and that the recurring statement, "worst ever known," was confirmed.

The lowest previous condition report on May 25 was 69.5 per cent in 1917. Last year's figure on this date was 75.6 per cent.

"Cotton is reported as poor to bad in all cotton States and in almost every county in the cotton belt," the announcement said. "The season throughout the belt is from four to six weeks late."

The report said that excessive winter and spring rains packed the soil and subsequent lack or shortage of normal rainfall over much of the belt from Texas to North Carolina caused the rapid drying out of the hard packed surface. Much planting was done "in the mud" and the cold, wet soil caused much rotting of seeds, while the cold nights and frosts caused a loss of many fields that had come to a stand and left many others thin and backward, lacking color and vigor.

Replanting has ranged as high as 40 per cent in some States and planting and replanting is still under way in all States, the report added.

"Weevil infestation is unusually severe in affected territory," the department said. Hot, clear weather is needed for both the growth of the plant and to hold the weevil in check, yet some rainfall is needed in most of the belt for proper development.

"The almost sole encouraging feature is the greatly increased use of fertilizer over recent years, from 10 to 35 per cent more is being used."

Comparisons of conditions by States follow:

State—	May 25— 1920.	1919.	1918.	1917.	10-yr. aver.
Virginia	71	89	89	75	87
North Carolina	70	85	84	63	80
South Caroline	68	78	80	70	75
Georgia	55	81	78	69	78
Florida	62	75	75	76	80
Alabama	58	78	78	61	78
Mississippi	65	73	86	66	80
Louisiana	72	74	85	74	79
Texas	60	76	82	74	80
Arkansas	61	68	85	64	79
Tennessee	60	64	90	63	80
Missouri	65	70	79	73	82
Oklahoma	70	65	86	77	79
California	86	91	91	82	92
Arizona	80	..	90	..	..
All others	63	..	80	..	..
U. S.	62.4	75.6	72.3	69.5	78.7

Cotton acreage and yield per ace, 1919, by States—revised estimates:

State—	Area planted (in cultivation tion end of June) 1919. revised.	Area picked 1919.	Yield per acre 1919.
Virginia	43,000	42,000	255
N. Carolina	1,525,000	1,490,000	266
S. Carolina	2,900,000	2,835,000	240
Georgia	5,404,000	5,220,000	152
Florida	122,000	103,000	74
Alabama	2,900,000	2,791,000	122
Mississippi	3,000,000	2,848,000	160
Louisiana	1,700,000	1,527,000	93
Texas	11,025,000	10,476,000	140
Arkansas	2,865	2,725,000	155
Tennessee	798,000	758,000	195
Missouri	132,000	125,000	257
Oklahoma	2,512,000	2,424,000	195
*California	185,000	185,000	268
Arizona	112,000	107,000	270
All other	10,000	10,000	250
*U. S.	35,133,000	33,566,000	161.5

*California figures include the entire Imperial Valley, which includes about 100,000 acres in Mexico which are not included in United States total.

For purposes of comparison, the condition of the cotton crop in the United States monthly and the estimate yield per acre for a series of years are given below:

Years.	May 25.	June 25.	July 25.	Aug. 25.	Sep. 25.
1920	62.4	...	...	...	...
1919	75.6	70.0	67.1	61.4	54.4
1918	82.3	85.8	73.6	55.7	54.4
1917	69.5	70.3	70.3	67.8	60.4
1916	77.5	81.1	72.3	61.2	56.3
1915	80.0	80.2	75.4	69.2	60.8
1914	74.3	79.6	76.4	78.0	73.5
1913	79.1	81.8	79.6	68.2	64.1
1912	78.9	80.4	76.5	74.8	69.6
1911	87.8	88.2	89.1	73.2	71.1
1910	82.0	80.7	75.5	72.1	65.9
1909	81.1	74.6	71.9	63.7	58.5
1908	79.7	81.2	83.0	76.1	69.7
1907	79.5	72.0	75.0	72.7	67.7

The cotton crop for 1919 compares with other years as follows, with the Government's December estimate, the final Census Bureau's estimate, and the final commercial estimate in previous years. Figures represent bales of 500 pounds, the first two columns excluding linters, the other including them:

	Agr. Dept. Dec. Est.	Census.	Comm'l
1919	11,030,000	11,329,755	.....
1918	11,700,000	12,040,532	11,360,000
1917	10,949,000	11,302,375	12,737,000
1916	11,511,000	11,449,930	12,737,000
1915	11,161,000	11,191,820	12,962,000
1914	15,966,000	16,134,930	15,136,000
1913	13,177,000	14,156,486	14,552,000
1912	13,820,000	13,703,421	14,104,000
1911	14,885,000	15,692,791	16,101,000
1910	11,426,000	11,608,616	12,075,000
1909	10,088,000	10,004,919	10,513,000
1908	12,920,000	13,241,799	13,817,000
1907	11,678,000	11,107,179	11,441,000
1906	12,546,000	13,273,809	13,540,000
1905	10,168,000	10,575,017	11,234,000
1904	12,162,000	13,438,012	13,654,000
1903	9,962,000	9,851,129	10,011,379
1902	10,400,000	10,784,473	10,725,422
1901	9,674,000	9,748,646	10,662,995
1900	10,100,000	10,245,602	10,401,453
1899	8,900,000	9,507,786	9,142,838

The area of cotton planted in 1919 and preceding years has been as follows:

	Acres.		Acres.
1919	35,133,000	1914	37,406,000
1918	37,073,000	1913	37,458,000
1917	34,925,000	1912	34,766,000
1916	36,052,000	1911	36,681,000
1915	32,107,000	1910	33,418,000

Cotton Crop Report

A. Norden & Co., Cotton Exchange Building, New York, have recently issued an interesting bulletin relative to the present condition of the cotton crop together with an estimate of average yield per acre.

The details of acreage planted for 1919-20 and 1920-1921 are as follows:

	Bureau Acreage 1919-20	Indicated Acreage 1920-21
North Carolina	1,454,000	1,395,840
Georgia	5,262,000	4,946,280
Alabama	2,990,000	2,930,200
Mississippi	2,939,000	2,850,830
Louisiana	1,445,000	1,358,300
Texas, N.	10,755,000	*11,077,650
Texas, C.	10,755,000	*11,077,650
Texas, S.	10,755,000	*11,077,650
Oklahoma	2,456,000	2,701,600
Arkansas	2,701,000	2,565,950
Tennessee	755,000	732,350
Sundries	583,000	728,750
Total	34,046,000	33,912,570

*Average increase Texas 3 per cent.

The report then gives the present crop outlook for the ten above mentioned states reduced to terms of percentage. Utilizing 100 per cent as a perfect condition the report gives the percentage condition of the cotton crop in these ten states as being 63.2 per cent. Comparing this with former years brings out the fact that 1919-20 had a percentage of 76.8; 1918119 was 78.7; 1917-18 was 72.4, while 1916-17 was 81.1.

The report concludes with the following observation: "It would appear from this report that the slight early increase in acreage has been lost owing to the very unfavorable weather conditions during the month, and this is confirmed by all the various details of our tables, which show that the crop enters the month of June with an exceedingly poor outlook for even an average yield per acre."

Exports of Rubber for April

Statistics recently issued by the Bureau of Foreign and Domestic Commerce, of the Department of Commerce Washington, D. C., show that the exports of rubber manufactures and insulated wire cables from the United States during April totalled $6,754,889. This does not include exports to Porto Rico and Hawaii.

The value of the articles exported(not including exports to Porto Rico and Hawaii) are as follows: belting, $219,499; hose, $205,573; packing, $111,127; boots, $81,236; shoes, $683,417; druggists sundries, $116,999; soles and heels, $107,290; automobile tire casings, $3,148,845; inner tubes, $370,520; solid tires, $328,502; all other tires, $58,034; all other manufactures of rubber, $797,301; insulated wire and cables, $526,556. Exports to Porto and Hawaii are as follows: belting, hose and packing, $50,895; automobile tires, $150,173; all other tires, $4,430; all other manufactures of rubber, $34,492.

McGraw Declares Dividend

Announcement has been made by the McGraw Tire & Rubber Co., of Cleveland, Ohio, that a quarterly dividend of one and three quarters per cent has been declared on the preferred capital stock of the company, payable July 1 to stockholders of record at the close of business on June 20.